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CONTENTS

FROM THE CHIEF	2	LETTERS TO THE EDITOR	35
<u>FEATURE ARTICLES</u>		<u>NOTES AND ANNOUNCEMENTS</u>	
Drug Abuse	4	Names and Faces in the News	43
Hurricane Celia	27	Internists Get Latest Information	46
READ ON MACDUFF	18	Gorgas Memorial Institute Annual Meeting	47
<u>PROFESSIONAL PAPERS</u>		Western EEG Society Meeting	47
The Hematologists' Corner—Coagulation		Special Parade for Patients at Medical Center ..	48
Problems in Obstetrics and Gynecology	8	Address by RADM Raffetto	50
New Office of Disability Evaluation	12	National Children's Dental Health Week	50
A Tissue Culture System for the Study of Drug		Promotion Breaks	50
Action Against the Tissue Phase of Malaria ..	19	Booklet on Drugs	50
Gastrointestinal Disorders in Vietnam Returnees..	23	Cholera Film	50
Asymptomatic Gonorrhea	36	Pensacola Slow Rotation Room	51
Maxillofacial Injuries	39	Official Instructions, Notices and Changes	52
Method for Preparing Permanent Whole Mounts		From the MC Detailer	53
of Parasitized Snails	42	Awards and Honors	53
		Isolation Techniques Manual	54
		Communicable Disease Manual	56
		Beards and Food Service Workers	56
		In Memoriam	56

Credits: All pictures are Official U.S. Navy Photographs unless otherwise indicated.

Cover photographs indicate some of the damage suffered by Naval Hospital, Corpus Christi, Texas at the hands of Hurricane Celia.

Page 2. During a visit in May 1970 to U.S. Naval Medical Research Unit No. 3 in Cairo, U.A.R. and its Field Facility in Addis Ababa, Ethiopia, the Surgeon General attended clinical rounds on NAMRU-3 Medical Ward. Personnel shown in picture from left to right are: Dr. N. Ayad, member NAMRU-3 medical staff; Dr. Anwar Hassan, Director, Abbassyah Fever Hospital; CAPT D. C. Kent, then the CO NAMRU-3; Mr. Abdel-Aziz Salah (behind CAPT Kent); VADM G. M. Davis, Surgeon General; Mr. Imam Ismail; RADM E. Faucett, Assistant Chief for Research and Military Medical Specialties, BUMED; and Dr. Z. Farid (back to camera).

Appreciation is expressed for assistance in graphic arts, ably rendered on short notice by Code 4542, BUMED.

from the Chief

By traditional proclamation during the month of November, our Nation, in a concerted expression of gratitude for the providential guidance bestowed upon her, honors her pioneers and defenders.

While our mission remains unalterably committed to the medical care and protection of officers and men who command and operate the ships, we have benefited from the keen perception of our predecessors who envisioned the need for diversifying our energies. Long before modern methods of transportation contracted distances to permit unprecedented mobility of people and disease, medical officers who recognized the importance of tropical and preventive medicine, established laboratories and courses in service medical schools for furthering education in this field. Physicians such as CAPT Robert P. Parsons, RADM's Edward R. Stitt, C. S. J. Butler, Harold W. Smith, John Harper and Charles Stephenson, by their exceptional contributions and professional ability, prepared us for future encounters with serious problems in parasitology, sanitary engineering, preventive medicine and tropical diseases. A solid foundation for continued research effort was established, ensuring a succession of advances and improvements in the prevention, detection and treatment of medical and surgical casualties.

Navy training and education programs in all the disciplines of medical and paramedical science have been developed and promoted throughout this century, some of them quite unique and to the lasting credit of Navy medicine. Without this vital capacity for providing timely and practical knowledge, it would not have been possible to consistently meet the medical demands of a naval service with such wide fluctuations in size, scope, distribution and basic requirements. As we now enter a phase of "reduced size—high quality" organization, this longstanding emphasis on training and education should serve us well.

A proper balance between highly specialized medical capabilities, and extended resources for providing competent generalized medical care, is essential and difficult to maintain. Despite the limitations imposed on our predecessors by military contingencies, prudent allowance for growth in both dimensions has been made. Our overall effectiveness compares favorably with that in civilian life. Recent interest in some of our operational methods suggests, moreover, that civilian adaptations of them may be anticipated in the future.



Long before an organized system of health care delivery to dependents was launched by the Dependents' Medical Care Act in 1956, the need for such services was recognized by Navy surgeons. Appreciating the futility of endeavoring to provide medical support for men at sea whose loved ones at home were deprived of comparable health care, it was customary for individual physicians to actively participate in dependent medical care. With the subsequent expansion of dependent health care needs outstripping available facilities and resources, an organized program for supplying these needs was developed and evolved within the military services. Had it not been for the professional interest, convictions, and actions of our predecessors, such an evolution of extended health care could have been critically delayed.

In this restless world beset with troubles, there is much for which we can be thankful. ☸





Drug Abuse*

by RADM J. W. Albright, MC, USN
Deputy Surgeon General

Thank you, Captain Turville, and Good Morning Ladies and Gentlemen. Let me begin on a somber note. Let me describe the condition of the world as it was reported in one of our American periodicals, in an article discussing the awful uncertainty of the future. I quote: "It is a gloomy moment in history. Not in the lifetime of any man who reads this paper has there been so much grave and deep apprehension; never has the future seemed so dark and incalculable. In France, the political cauldron seethes and bubbles with uncertainty. England. . . is being sorely tried and exhausted in a social and economic struggle. The United States is beset with racial, industrial, and commercial chaos—drifting we know not where. Russia hangs like a storm cloud on the horizon of Europe—dark and silent. It is a solemn moment, and no man can feel indifference. . . of our own troubles, no man can see the end."

Is this an accurate description of the world today? One would have to think so, despite the fact that the article I have just quoted from was published in *Harpers Magazine* on 10 October 1847, 123 years ago.

RADM J. W. Albright, MC, USN, delivered the keynote address, reprinted above, at the Drug Abuse Symposium, NNMC, on 3 June 1970. The 2-day Symposium was held under the joint direction of the Naval Medical School and the Chaplains' Department of the Medical Center. More than 300 Navy and civilian personnel, from a 150-mile radius of Bethesda, attended. Although planned earlier, the symposium coincided with President Nixon's proclamation—a week before—of National Drug Abuse Prevention Week. Speakers, representing Federal law enforcement agencies as well as Navy and civilian medical professional experts in the problem of drug abuse, participated.

Does this prove the truth of the old cliché that "There is nothing new under the sun"? I don't think so, for in our modern society we face new, and very real, challenges that were merely dreams at an earlier time in the history of man. We also face new problems—and one of these problems is the subject of this symposium.

Drug addiction, of course, is not a new problem. We have had addicts of one sort or another, who are addicted to a wide range of substances, practically since man began. But drug abuse, as it is practiced today by the young and by the not so young in this "Age of Aquarius," is new. Drug abuse has, in fact, become a real problem and the problem is growing larger.

Why has this happened? What can we do about it, particularly the problem that exists in this Nation's military forces in general and our naval forces specifically? I do not pretend to know all the answers, but I would this morning like to tell you how I feel about the problem. I do not expect all present to agree with me. I admit much of what I have to say is controversial and for the sake of a good conference I want it to be controversial.

Certainly the world's condition as previously described in *Harpers Magazine* really hasn't changed that much. But it seems to me that we live in an age of contradictory actions. For example: Man's oldest dream of traveling to the moon is realized, and the society which developed the technical expertise that made this dream a reality is the same society in

which children are injected with heroin to give them that little "extra" incentive to be better "dope pushers" among their peers. We have become the richest nation in the world, and are told that thousands of our citizens are starving to death. Our educational institutions offer more to more young people than ever before—and some of these very same young people attack institutions which are not considered "relevant" to the students' concept of the modern world. Our society enjoys more freedom, more material wealth, and more unfettered life styles than ever before; and the defense counsel of a defendant, who was sentenced to 72 years in prison after he confessed to the brutal rape of two women, tells the judge that society is to blame for making his client commit such a crime. Our young men are getting bigger and better looking; our young women have become more graceful and beautiful; and with their unisex clothing it is sometimes terribly hard to tell them apart, from the front or the back. It's enough to "blow" anybody's mind.

The permissiveness which has swept this country has, in my judgment, been a very important factor in the development and escalation of the problem that you will discuss for the next two days. No society or nation can exist for any length of time without discipline, and I sincerely believe that the problem of drug abuse which plagues this Nation today is a direct result of the undisciplined growth of our younger generation. Discipline, of course, begins in the home and should begin at a very early age. I feel that it is here where we should look for the root cause of this problem.

Disciplined family life in many homes began to deteriorate in the middle 1940's in this country, and so to me, it is not at all surprising to find that the average drug abuser in the Navy was born between 1947 and 1952. His family life began to disintegrate under the economic and political impact of World War II. It was during this period that mother and father both had jobs—either for reasons of economic necessity or because it was the patriotic thing to do. Of course, they had more money; but the increased financial capacity brought new wants at higher prices, and somehow we never seemed to return to the ancient and honorable custom of father being the breadwinner and mother the homemaker. Some American homes ceased to be the places where parents and children enjoyed the close interpersonal relationship that is the strength of the family. The stable and secure family, where the process of maturation initially and quite rightly begins, became less com-

mon. In my opinion, without security, love, and discipline in the home, normal development of our youth in our highly civilized society cannot occur.

By the early 1950's we had become a nation of consumers. "Keeping up with the Joneses" required extra efforts, overtime, two jobs; and the merry-go-round that we ride today started to whirl. The home became a place where members of the family slept or ate a quick meal. The parents, with little free time, began to use what time was available in pursuit of their own pleasures for, after all, hadn't they earned it? The children, unsupervised and left to their own devices, began to look for new diversions to occupy their time between sleeping, eating, and school. First, there was a loss of parental control; and secondly, as a direct result of this, there was a deterioration of discipline in our schools.

There was nobody around to tell them what was right and what was wrong. The generation of the fifties, and now the sixties, had all the material niceties modern America could offer. But they were never exposed to certain facts of life—the most important being that for every action there is a counteraction and for every action somebody must take the responsibility. I honestly believe that this "wandering around" in an unstructured and undisciplined environment, where youths had a lot of leisure time and little guidance from their elders, was a major factor in the current experimentation that we see in so many young people today, whether this experimentation is in sex, life styles, or drugs. I hope and believe that we are currently beginning to see a change, a move back to the solid family life, and I say, "Thank God." I see it in the attitude of our young married couples with children.

I cannot condone these experimentations for, despite what some of our learned people say, they are far more likely to produce irreparable damage than the corn silk smoking, secret beer drinking, and wild pranks of previous generations, including yours and mine. I can understand how young people can react in this way. It is obvious what happens when a young person, or any persons for that matter, suddenly encounters problems and pressures that he is not equipped by experience, knowledge, or self-discipline to handle. If he can't ignore them, he must run away. And that is what some of our young people have done. They have run away from the real world because they were not equipped to handle the situations that every person must someday or another encounter. They ran away into a world of communes, into a world of garish costumes which by

their very sameness mock the young's cry of "individualism," and into a world of drugs.

Perhaps the medical profession is in some degree responsible for the increased use of drugs. I have felt for years that we as physicians have been much too free in prescribing sleeping pills, nerve pills, tranquilizers, reducing pills, etc. We have introduced to pills many inadequate people who became psychologically dependent.

Today we in the Navy are experiencing an ever increasing problem with those who chose this latter method of escape, particularly in the last two years. The other military services and, in fact, the entire country are undergoing the same experience. In 1968, for example, there were a little over 6,000 drug abuse cases in the Naval Service. In 1969 this number increased by better than 50 per cent. In 1968 about 2300 sailors and marines were discharged for drug abuse—a 400 per cent increase over the previous year. In 1969 this number increased again by better than 50 per cent. During the first two months of 1970 there were approximately 1900 drug abuse cases. If this rate remains constant for the entire year, we will have something over 11,000 cases and approximately 4500 people discharged from the Navy or Marine Corps for drug abuse. Startling figures, to say the least.

Let me very briefly describe for you the average drug abuser in the Naval Service. Remember this is the young man, and sometimes young lady, who is a product of the home and family life of the late 40's and early 50's that I spoke about. He is frequently the product of a broken home or one in which one or both parents are alcoholics, or a home in which one or both parents go their separate ways. He is young, ranging in age from 18 to 23 years. He is generally non-rated and single. His IQ may range from the lowest acceptable for Naval Service to the superior level. He has generally had some high school and may even be a high school graduate with some college. He comes from every strata of our society.

From a physician's standpoint, he may be placed into three general categories: First: He may be a borderline psychotic or suffer from a character or behavior disorder. Second: He may be an antisocial or sociopathic personality. Third: He may be an experimenter because he suffers from the common anguish produced by adolescent turmoil.

Which one of these three categories of drug abusers can we, or should we, help? Let me preface my next remarks with an old Medical Department axiom which guides our physicians and corpsmen aboard

ship in the treatment of battle casualties. "Treat the lesser wounded first in order that they may return to their battle stations to protect the ship." I think that this old rule is applicable in deciding which category of drug abuser we should help.

In my judgment we in the Navy cannot and should not treat those who fall into the first two categories—the psychotic or character disorder—because there is little with present day knowledge that can be done to improve a life already destroyed by a poor socioeconomic beginning, a broken home, or an emotionally fragmented family. Less can be done for the anti-social or sociopathic personality because he is a loner, he lacks social conscience and a commitment to any cause, and he is constantly manipulating a situation for his own gain—truly almost any effort would be unsuccessful.

The Navy basic policy is to discharge those falling into these two groups. Why? These basic personality or character disorders exist prior to entry into the service, and at the time of entrance, some are already drug abusers or addicts. They are unreliable or very borderline performers and may jeopardize the lives of others. Treatment is prolonged and they respond better in civilian circles free of the stresses of military life. Unfortunately many individuals falling into these two groups are almost completely refractory to treatment under the best circumstances and therapy known today.

It is the third category—the experimenter—whom we can and must help. He is vulnerable to the pressures of our modern world, but he is also salvageable. He meets the definition of "lesser wounded" and we need him to help protect the ship. He is neither the mentally ill individual nor does he have a character or behavior disorder or severe personality disorder. He is immature and inexperienced.

In this era of diminishing resources, it is this young sailor or marine upon whom we must concentrate the full power of our disciplinary and health care systems and the total expertise of our professional capabilities. He can be helped and he deserves our help. He is a normal young man—impressionable and open to suggestion—trying to find his place in our society. He wants to "belong" though he doesn't have much of an idea how to go about doing so and he is constantly experimenting to find the way. He is wide open to the trouble-producing suggestions of his shipmates and, whether or not he acknowledges it, he is a member of the "establishment" with the same hopes and dreams that we all have for a better world. His only weakness is that he

has not yet grown up. So he experiments with drugs, communal sex, different life styles, with anything he thinks will help him to find his particular place in this galaxy of people we call the world. He has a conscience and is worthy of all our efforts on his behalf. He has a 95 per cent chance of responding to proper handling.

The Chief of Naval Operations in 1968 established a Drug Abuse Team to provide a particular type of help to this young man. Team members travel extensively to every naval command—here and overseas—to provide information on drug abuse and its dangers. The Team seeks to help him through education—through developing an awareness that he has never had before. And their efforts are successful in guiding the young, immature, and inexperienced through the period of adjustment; such efforts are of little benefit to the other two types of individuals.

A Congressman from New York recently introduced a bill which would authorize public health officials, through Federal district courts, to commit addicts to medical facilities for treatment and rehabilitation. Should we in the Navy try the same approach? I think not because (1) we have very few addicts and (2) we simply don't have the facilities and personnel to provide such treatment. The young "experimenter"—he is not an *addict*—must be rehabilitated, it is true; but it will take the cooperative efforts of the chaplain, the physician, and the line officer to do so. In attempting to provide a program of rehabilitation for the drug abuser, we must first resolve the controversy of drug abuse itself. Is the taking of drugs harmless and therefore not a problem, as one faction feels? Or is the attitude of the other faction, that *all* drugs are evil, correct? The answer, as usual, lies somewhere between. We must base any action taken on a resolution of this controversy, and we must resolve it soon.

We must also take into consideration the Navy of the future. The Chief of Naval Operations has stated that the Navy in the latter part of the 20th century will be smaller and the emphasis will be on quality rather than quantity. I agree 100 per cent with this concept, but it does raise some interesting questions. Will any sailor or marine who takes drugs be able to operate efficiently in this Navy of the future? Should we, in an effort to improve this quality, go to the expense of providing rehabilitation support for the drug abuser whose abuse is the result of preservice experience or a direct disobedience of regulations? Do we have not only a moral but a legal obligation to provide this type of care? Should the Navy be

placed in a position of trying to solve one of the social problems of this country? In light of present knowledge, I would have to answer all these questions with a negative. These questions, however, must be carefully considered as we make plans for the Navy of the future.

It seems to me that, in the final analysis, our youth will ultimately have to learn how to enjoy, endure, and mature in this "mind boggling" modern world without relying on numbing, reality-distorting substances of any kind. We all know that there will never be a painless world. People will always get hurt and die. Wars will probably continue to be a part of our lives, as long as the human race has the same instincts and needs and desires. Except for the technical advances, the world really hasn't changed that much because the people are the same. Death, while it may come to a larger segment of the population simultaneously, is really no more sure than it was in the days of the world conquerors, when the thrust of a spear or the slash of a sword blotted out a man's sight forever. Our social problems, while they may be lessened, will continue.

I think it is important to remember that, while every generation has had its share of growth and grief, love and hate, pain and pleasure, not every generation has chosen to evade the realities of living by escaping into the euphoric world of drugs.

We do have a problem; but no problem, given the skilled attention of intelligent, motivated, mature people, is insolvable. You are here for the next two days to discuss our problem.

In closing, I would ask that you remember these recent words of the President of the United States: "Statistics tell but part of the tragedy of drug abuse. The crippled lives of young Americans, the shattered hopes of their parents, the rending of the social fabric as addicts inevitably turn to crime in order to supply a costly habit—these are the personal tragedies, the human disasters that tell the real story of what drug abuse does to individuals and can do to our nation."

The problem is real. The solution must be realistic. We urgently need to find better ways of preventing the spread of drug abuse and addiction, and we urgently need better ways of treating drug abuse and addiction. As a long-term, idealistic, and far out objective, we need to create a society which produces fewer individuals with the defects predisposing to drug abuse and addiction. These defects by and large are not present at birth, but are produced by an adverse environment. ☸

THE HEMATOLOGISTS' CORNER—COAGULATION PROBLEMS IN OBSTETRICS AND GYNECOLOGY

*By LCDR N. J. Prendergast, MC, USN, Hematology Fellow, Hematology Branch,
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Less than ten years ago the only reference to disorders of coagulation mentioned in standard textbooks in Obstetrics and Gynecology was "hypofibrinogenemia" of term pregnancy. In the brief interval since then our understanding of the basic physiology and pathophysiology of blood coagulation has become considerably refined and clinically applicable. The obstetrician and gynecologist are in a unique position to encounter initial recognition of bleeding disorders in the female, and a fundamental knowledge of diagnoses and management will curtail untold anxiety, surgery, and therapeutic excessiveness. The purpose of this survey is to point out those coagulopathies likely to confront the obstetrician and gynecologist, and to provide some guidelines for proper identification and management of such disorders.

For the necessary basic understanding of the physiology and biochemistry of the coagulation mechanism the reader is referred to any of the excellent texts currently available on the subject.¹⁻⁴ Only a brief review of the basic knowledge can be offered here. The initial physiologic response to traumatic bleeding consists of vasoconstriction and vasoretraction. This is quickly followed by the formation of a platelet plug. The platelets are stimulated to adhere and aggregate at the site of vascular injury by contact with collagen which is exposed when vessel endothelium is disrupted. The final insoluble fibrin clot is generated either in the adjacent tissue (extrinsic system) or within the damaged vessel (intrinsic system) through a sequence of enzymatic activations of various plasma proteins which constitute the coagulation factors (Figure 1).

The fibrinolytic system (plasmin) is in opposition to the coagulation system and serves physiologically to contain clotting at the local level and to provide recanalization during the healing phase after tissue injury. The controls placed on the plasmin system include: (a) localization to area of the clot; (b)

circulating inhibitors (anti-plasmins); and (c) clearance of plasmin from the circulation by the reticuloendothelial system and the liver (Figure 2).

Currently available tests of the integrity of the coagulation and fibrinolytic systems are sensitive only to gross depletion or excess of the factors involved. Fortunately clinically significant bleeding usually does not occur without gross depletion. The Ivy and Duke bleeding times screen diseases affecting the small blood vessels and platelet functions. Quantitative platelet defects may be estimated by examination of the peripheral smear and documented by direct platelet counts in phase microscopy. The factors involved in the extrinsic system may be estimated from the prothrombin time (PT) and those involved in the intrinsic system may be assayed with the partial thromboplastin time (PTT). The fibrinogen level may be measured directly in the clinical laboratory or assayed with the thrombin time. Specific factor assays are now available using mixing tests with patient plasma and known specific factor deficient plasma obtained from commercial sources. Excessive fibrinolysis may be shown by direct observations of the clot in a glass tube at the bedside. The euglobulin lysis test and immuno-diffusion plate assay for fibrin split products are readily adapted to any clinical laboratory. In suspected coagulation disorders an adequate screening battery of tests would include: bleeding time, silicone clotting time, platelet count, thrombin time, prothrombin time, partial thromboplastin time, and fibrinogen assay. These tests may be accomplished in most general laboratories, twenty-four hours a day, in less than one hour and will pinpoint the majority of coagulation disorders.

The coagulopathies of particular interest to the obstetrician-gynecologist may be divided into those associated with: (a) third trimester pregnancy and the puerperium; (b) the neonatal period in the infant; and (c) excessive menstrual bleeding.

FIGURE 1

THE COAGULATION SYSTEM

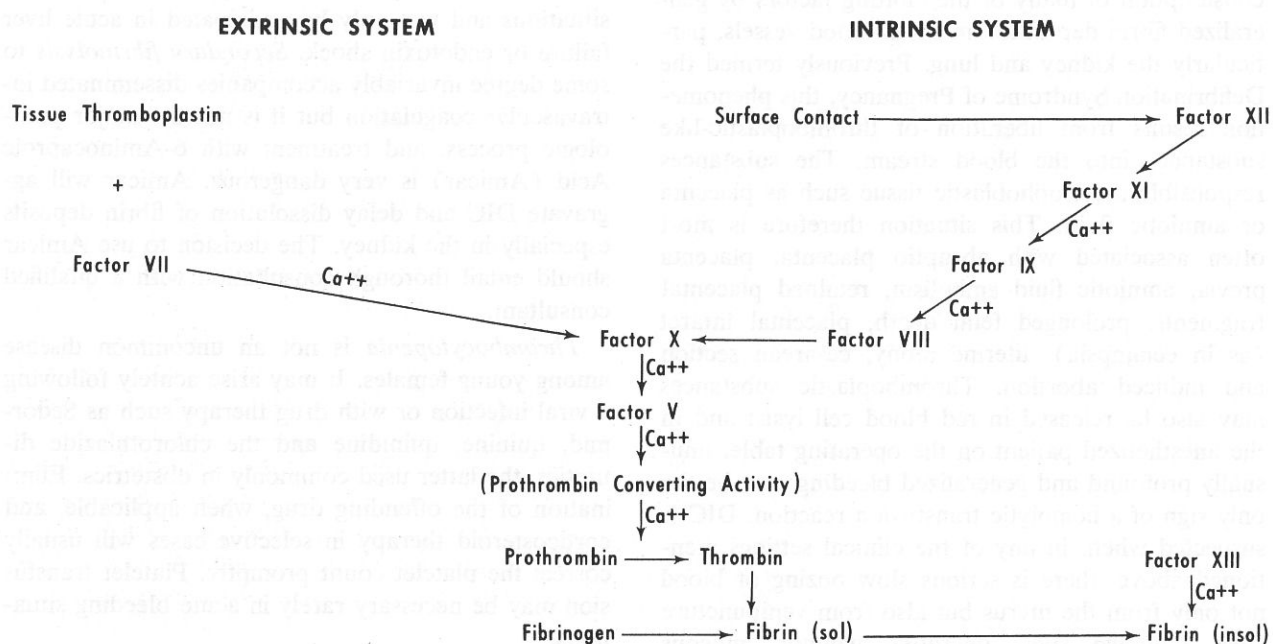
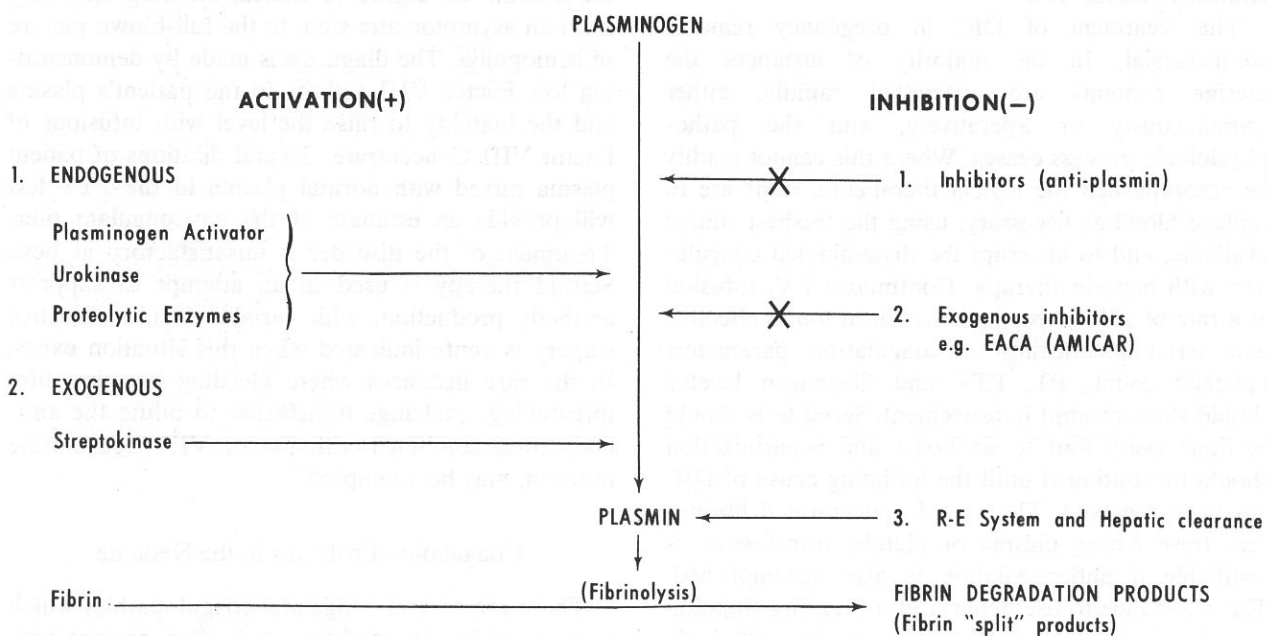


FIGURE 2

THE FIBRINOLYTIC SYSTEM



Coagulation Disorders in Pregnancy

The most common coagulopathy of pregnancy is *Disseminated Intravascular Coagulation (DIC)* with consumption of many of the clotting factors by generalized fibrin deposition in small blood vessels, particularly the kidney and lung. Previously termed the Defibrination Syndrome of Pregnancy, this phenomenon results from liberation of thromboplastic-like substances into the blood stream. The substances responsible are trophoblastic tissue such as placenta or amniotic fluid. This situation therefore is most often associated with abruptio placenta, placenta previa, amniotic fluid embolism, retained placental fragments, prolonged fetal death, placental infarct (as in eclampsia), uterine atony, cesarean section and induced abortion. Thromboplastic substances may also be released in red blood cell lysis; and in the anesthetized patient on the operating table, unusually profound and generalized bleeding may be the only sign of a hemolytic transfusion reaction. DIC is suspected when, in any of the clinical settings mentioned above, there is serious slow oozing of blood not only from the uterus but also from venipuncture sites, cutdown sites, operative wounds, mucous membranes, and the GI tract. The diagnosis is confirmed by demonstrating low platelet count, prolonged prothrombin and partial thromboplastin times, and low fibrinogen level secondary to depletion of specific clotting factors. The recently reported ethanol gelation test to demonstrate the soluble fibrin monomers seen only in DIC has yet to be proved a clinically useful test.⁵

The treatment of DIC in pregnancy remains controversial. In the majority of instances the uterine contents are evacuated rapidly, either spontaneously or operatively, and the pathophysiologic process ceases. Where this cannot readily be accomplished the logical therapeutic steps are to replace blood as necessary, using the freshest source available, and to interrupt the disseminated coagulation with heparin therapy. Continuous I.V. infusion at a rate of 2000 u per hour has been found effective and serial monitoring of coagulation parameters (platelet count, PT, PTT and fibrinogen levels) should show prompt improvement. Serial tests should be done every four to six hours and heparinization should be continued until the initiating cause of DIC has been removed. The use of concentrated fibrinogen, fresh frozen plasma or platelet transfusions is justifiable if anticoagulation is also accomplished. The reluctance to use heparin in a bleeding situation may be obviated by examination of the pathologic

process and by considering the brief duration of action (4 hours) of this compound. Also the action of heparin may be quickly reversed by protamine.⁶

Primary fibrinolysis is distinctly rare in obstetrical situations and will only be anticipated in acute liver failure or endotoxin shock. *Secondary fibrinolysis* to some degree invariably accompanies disseminated intravascular coagulation but it is not the major pathologic process, and treatment with 6-Aminocaproic Acid (Amicar) is very dangerous. Amicar will aggravate DIC and delay dissolution of fibrin deposits especially in the kidney. The decision to use Amicar should entail thorough consultation with a qualified consultant.

Thrombocytopenia is not an uncommon disease among young females. It may arise acutely following a viral infection or with drug therapy such as Sedor-mid, quinine, quinidine and the chlorothiazide diuretics, the latter used commonly in obstetrics. Elimination of the offending drug, when applicable, and corticosteroid therapy in selective cases will usually correct the platelet count promptly. Platelet transfusion may be necessary rarely in acute bleeding situations.

Occasionally the obstetrician may encounter a *hemophilia-like* condition in the *post partum female*. This is caused by the development of a *circulating anticoagulant*, usually an antibody directed against Factor VIII. It is acquired by transplacental transfer from the fetus. The level of the anticoagulant decays over a period of several months to two years and in the interim the degree of clinical bleeding may vary from an asymptomatic state to the full-blown picture of hemophilia. The diagnosis is made by demonstrating low Factor VIII activity in the patient's plasma and the inability to raise the level with infusions of Factor VIII Concentrate. Several dilutions of patient plasma mixed with normal plasma in the PTT test will provide an estimate of the anticoagulant titer. Treatment of the disorder is unsatisfactory at best. Steroid therapy is used in an attempt to suppress antibody production, with variable results. Elective surgery is contraindicated when this situation exists. In the rare instances where bleeding becomes life-threatening, exchange transfusion to dilute the antibody titer, combined with Factor VIII Concentrate infusion, may be attempted.⁷

Coagulation Problems in the Neonate

There are several congenital coagulopathies which may occur in the newborn, and often present with

umbilical cord stump bleeding or at the time of circumcision. The reader is referred to standard pediatric textbooks on these matters. Of more interest to the obstetrician are those neonatal bleeding disorders caused by disease in the mother. The neonate may become thrombocytopenic as a result of the transplacental transfer of platelet antibody from a mother with idiopathic thrombocytopenic purpura or thrombocytopenia secondary to drug therapy as was previously mentioned. Thrombocytopenia should be suspected in all neonates of thrombocytopenic women. Finally there is an isoimmune thrombocytopenia in neonates analogous to erythroblastosis fetalis. In these instances the mother's platelets are negative for the PI^{A1} antigen, the father is PI^{A1} positive, and the fetus is PI^{A1} positive. The mother becomes sensitized to PI^{A1} + platelets through placental transfer of fetal platelets and transfers the antibody back to the fetus. When this situation is severe in the neonate, treatment consists of exchange transfusion using fresh whole blood, or platelet transfusion using maternally compatible platelets.⁸

Menorrhagia in Coagulation Disorders

The fact that many marked deficiencies of coagulation factors are not associated with excessive menstrual bleeding indicates that endometrial hemostasis is effected by mechanisms not well defined at this time, mechanisms other than those directly involved in coagulation. Normal menses are usually seen in: congenital afibrinogenemia, congenital hypofibrinogenemia, "female" hemophilia A (Factor VIII deficient) and congenital hyperheparinemia.

Menorrhagia is most often seen in deficiencies involving: platelets; Factor V (Labile Factor); Factor VII (Stabile Factor); Factor X (Stuart-Prower Factor); and Factor VIII (Von Willebrand's Disease). Quick believes Von Willebrand's Disease is a very common cause of otherwise unexplained menorrhagia and the diagnosis is often missed because laboratory tests are often equivocal.⁹ This disease is inherited in both sexes as a simple mendelian dominant and consists of mild to severe Factor VIII deficiency with qualitative platelet dysfunction. The patient with this disorder presents a mild bleeding history, including epistaxis and hemorrhage at tonsillectomy, menorrhagia and tendency to bruise easily. The family history for similar symptoms is also positive. The diagnosis is made on the basis of a positive

history and demonstration of a prolonged bleeding time, low Factor VIII assay, and qualitative platelet dysfunction. Prolongation of the bleeding time with aspirin administration has also been observed and may have some diagnostic usefulness. Hematology consultation should be obtained on all patients with menorrhagia not explained by an anatomical lesion or endocrinopathy, or in any patient with a history of bleeding tendency or with a positive family history.⁹

Summary

Recent advances in our understanding of blood coagulation are of great interest and importance to many physicians besides hematologists and internists. The only physicians to attend many women are the obstetrician-gynecologists and many disorders of coagulation present with obstetrical and gynecologic symptoms. A high index of suspicion that a coagulopathy could cause OB-GYN bleeding will lead to early diagnosis and effective therapy. A routine screening battery of coagulation tests is suggested which is simple, inexpensive, and readily available, and which will serve to identify the disorder in the majority of cases. The importance of mutual consultation between the obstetrician-gynecologist and the internist cannot be overemphasized.

REFERENCES

1. Owen, C. A., et al: The Diagnosis of Bleeding Disorders. Little, Brown and Company, Boston, Mass., 1969.
2. Biggs, R., and MacFarlane, R. G.: Human Blood Coagulation. 3rd Edition, F. A. Davis Company, Philadelphia, Pa., 1962.
3. Dacie, J. V., and Lewis, S. M.: Practical Haematology. 4th Edition, Grune and Stratton, Inc., New York, N.Y., 1968.
4. Fort, A. T.: Fibrinolytic Disorders in Obstetrics. *Postgrad Med* 41:6:630, June, 1967.
5. Breen, F. A., and Tullis, J.L.: Ethanol Gelation; A Rapid Screening Test for Intravascular Coagulation. *Ann Intern Med* 69:6:1197, Dec., 1968.
6. Mersky, C., et al: Pathogenesis of Fibrinolysis in Defibrination Syndrome; Effects of Heparin Administration. *Blood* 24:701-715, 1964.
7. Frick, P. G.: Hemophilia-Like Disease Following Pregnancy With Transplacental Transfer of an Acquired Circulating Anticoagulant. *Blood* 8:598-608, 1953.
8. Adner, M. M., et al: Use of Compatible Platelet Transfusions in Treatment of Congenital Isoimmune Thrombocytopenic Purpura. *New Eng J Med* 280:5:244, Jan. 30, 1969.
9. Quick, A. J.: Menstruation in Hereditary Bleeding Disorders. *Obstet-Gynec* 28:1:37, July, 1966.

NEW OFFICE OF DISABILITY EVALUATION*

By CAPT H. O. Kretzschmar, MC, USN, Code 33, BuMed

Prior to 1949, the military services had no comprehensive disability evaluation system. The physically unfit officer was retired with 75% of his base pay whereas enlisted men were separated with their only recourse being the Veterans Administration. In 1949, the Career Compensation Act (10 U.S. Code) was passed. This legislative action provided that amongst other things, the Secretary of the service concerned prescribe regulations for the administration of this act within his department or agency. It removed the different treatment of officer and enlisted man. Another important feature of this act was that "no member of the armed forces may be retired or separated for physical disability without a full and fair hearing if he demands it." Within the Department of Defense a committee was established to draft regulations to implement the law. In general the military services agreed that except for minor differences in terminology, the systems adopted would be relatively similar.

*On October 8, 1970, the author spoke before the Texas Annual Statewide Rehabilitation Conference for Veterans Service Officers. With the author's permission, the speech is reproduced here. CAPT Kretzschmar is the Director, Physical Qualifications and Medical Records Division of BuMed. To him and his fine staff goes much of the credit for conceiving, developing, and "selling" a new disability evaluation system. As a result of their efforts, the future disposition of Navy personnel rendered unfit for duty by reason of physical disability will be effected with greater equity and dispatch than has ever before been achieved.

It was envisioned that cases would originate at the hospital level by a board of medical officers; that based on the medical board report, the Physical Evaluation Board, consisting of one medical and two non-medical members, would evaluate the party's fitness for duty and would make recommended findings and submit the record of proceedings to the Physical Review Council in the Navy Department for review by representatives of the Chief medical, legal and personnel officers of each of the services. The purpose of such review was to insure uniformity of interpretation and application of law and to advise the Secretary as to the proper action to be taken. In non-controversial cases it was contemplated that the review of the Physical Review Council would be the final review and disposition would be effected according to the recommendation of this Council. Controversial cases, which represent a small percentage, were referred to an appellate body known as the Physical Disability Review Board where appeals would be heard and recommendations submitted to the Secretary for final action. (Fig. 1)

In later years it became necessary to make some procedural changes within the system, one of which allowed for the Physical Evaluation Board to make recommendations based on a review of the record alone. That is the *prima facie* finding. If acceptable to the member, the case then would proceed as an

FIGURE 1.

NAVY DISABILITY EVALUATION SYSTEM

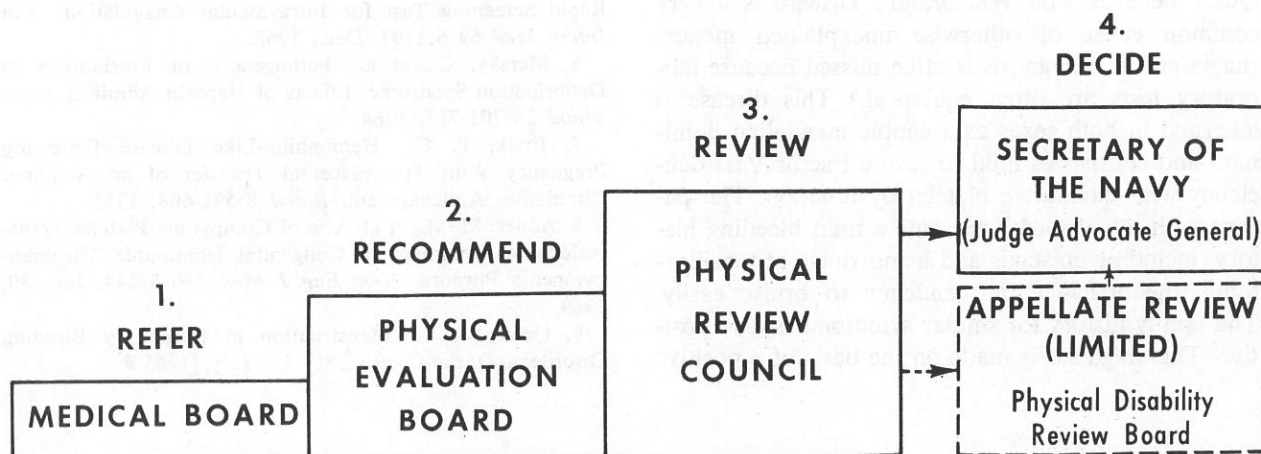
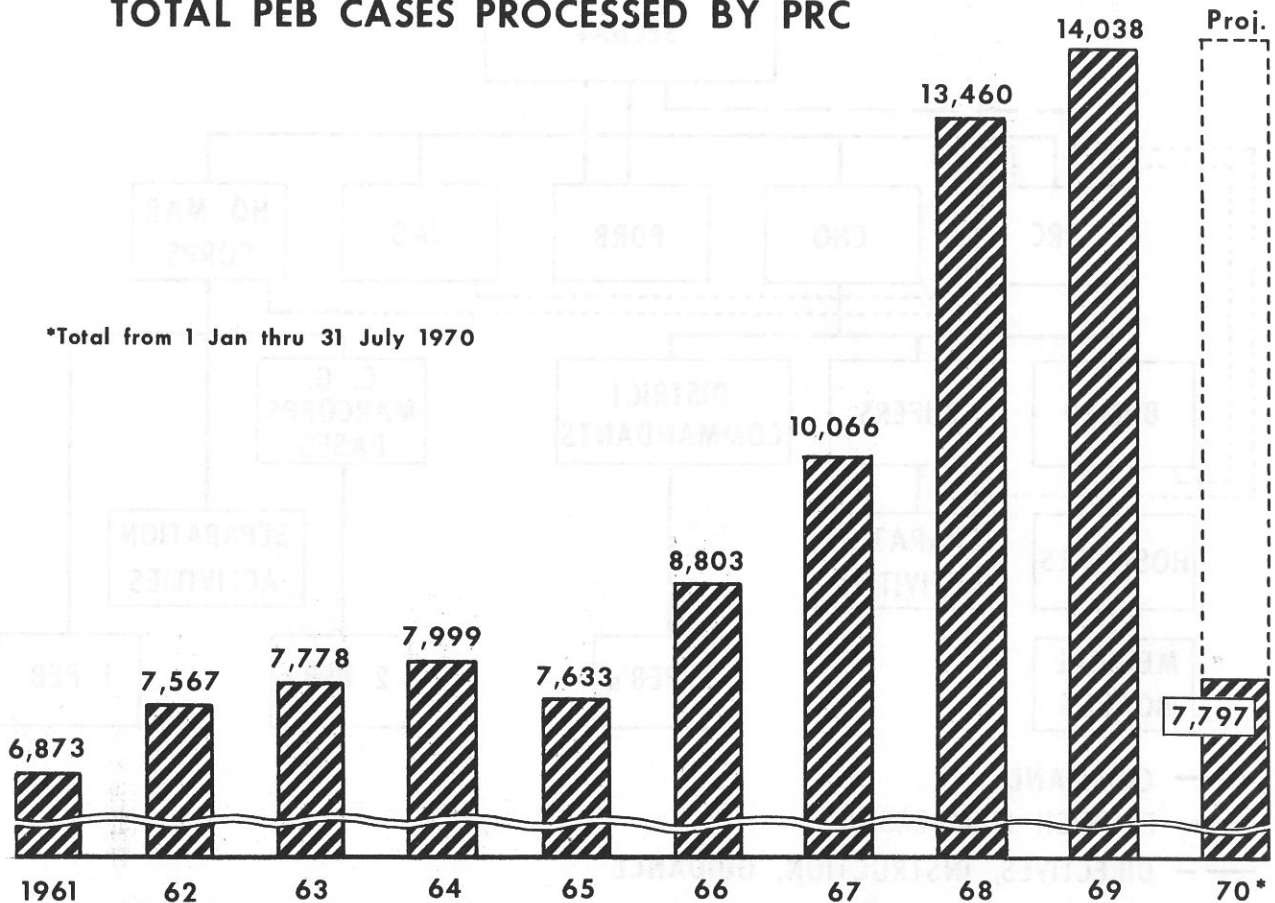


FIGURE 2.

TOTAL PEB CASES PROCESSED BY PRC



uncontested case via the Physical Review Council to the Secretary of the Navy. If the member did not accept the prima facie recommendations, a full and fair hearing was held.

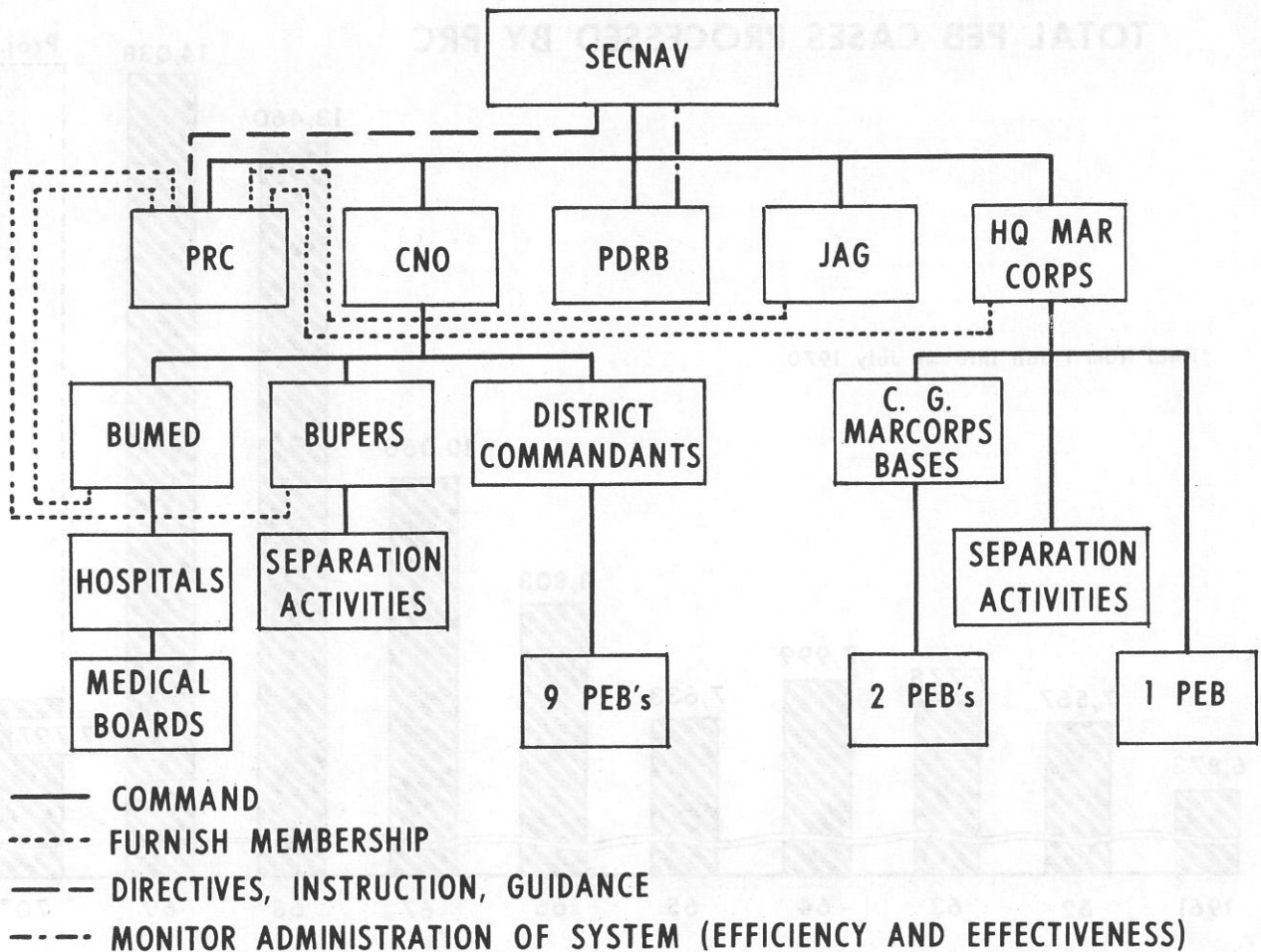
This is the picture of the physical disability retirement system which has been operational for the past 21 years and its basic premises are sound and good. However, in recent years all services have experienced an increase in workload. Army and Air Force made administrative changes. We in the Navy have made several attempts to reorganize our system. In the meantime, the workload had increased and yet the personnel administering the system remained essentially constant. (Fig. 2) It might be of interest here to point out that in 1965, the Temporary Disability Retired List contained the names of 10,056 sailors and marines. There were 14,038 on the TDRL in 1969 and by the end of this year the list will approach 18,000.

The existing "organization" was confusing at best. Attempting to draw up an organizational chart of our

Naval Disability Evaluation system's organization was not an easy task. There were twelve physical evaluation boards convened by naval district commandants, the commanding generals of two Marine Corps bases and the Commandant of the Marine Corps. (Fig. 3) In 1969, no less than 640 different names appeared as Physical Evaluation Board members and various appointing orders of these boards. The Physical Review Council which reviewed all recommended findings had no authority to direct. It could only recommend and suggest. The full impact of the Vietnamese war casualties quickly overtaxed the capabilities of this system and it began to break down.

In December 1968, the Surgeon General of the Navy convened a committee to study the situation and recommend measures for improvement. This was "Project Streamline" and eventually included representatives from BUPERS, HQ MARCORPS and JAG as well as BUMED. This group developed the concepts which were approved by the Secretary

FIGURE 3



in October of 1969 and which formed the basis for our new organization. The Office of Naval Disability Evaluation became operational on 1 October 1970. The Director of the Office of Naval Disability Evaluation, a staff office directly under the Secretary, now has the responsibility to direct the overall effort and the necessary authority to go with it, to carry out the mission assigned by the Secretary and to permit supervision, direction and standardization of all functions and activities of the Disability Evaluation System. This is the organization that has been developed. (Fig. 4)

In the immediate office of the Director are the Deputy; the Executive Assistant who acts as the right hand of the Director and Deputy, (Navy MSC Officer, CDR); the Management Information Officer who is a statistician and correspondence officer; and an Administrative Officer in charge of the general paper flow. Located in the same building are the Physical Review Council and the Central Physical Evaluation Board. The Physical Review Council has

retained essentially the same membership as before, namely, that of a Navy and Marine Corps line, a medical and a JAG Corps officer. It should be noted that the members now are designated by CMC, BUPERS, BUMED and JAG for constitution of the Physical Review Council in lieu of the old membership of that body, that is, the Director of Personnel Marine Corps, the Chief of Naval Personnel, the Surgeon General and the Judge Advocate General or their representatives. In the same office building will be located the Central Evaluation Board convened by the Director of the Office of Naval Disability Evaluation. This is new. There are two tremendous advantages to this type of centralization. It will assure as much as is humanly possible the uniform application of standards and laws. We all have been familiar with the fact that in the past a Physical Evaluation Board made prima facie recommendations, the party demanded a full and fair hearing, and the same body that had made the prima facie recommendation proceeded to hold a full and fair hearing. This will no

ORGANIZATION OF THE OFFICE OF NAVAL DISABILITY EVALUATION

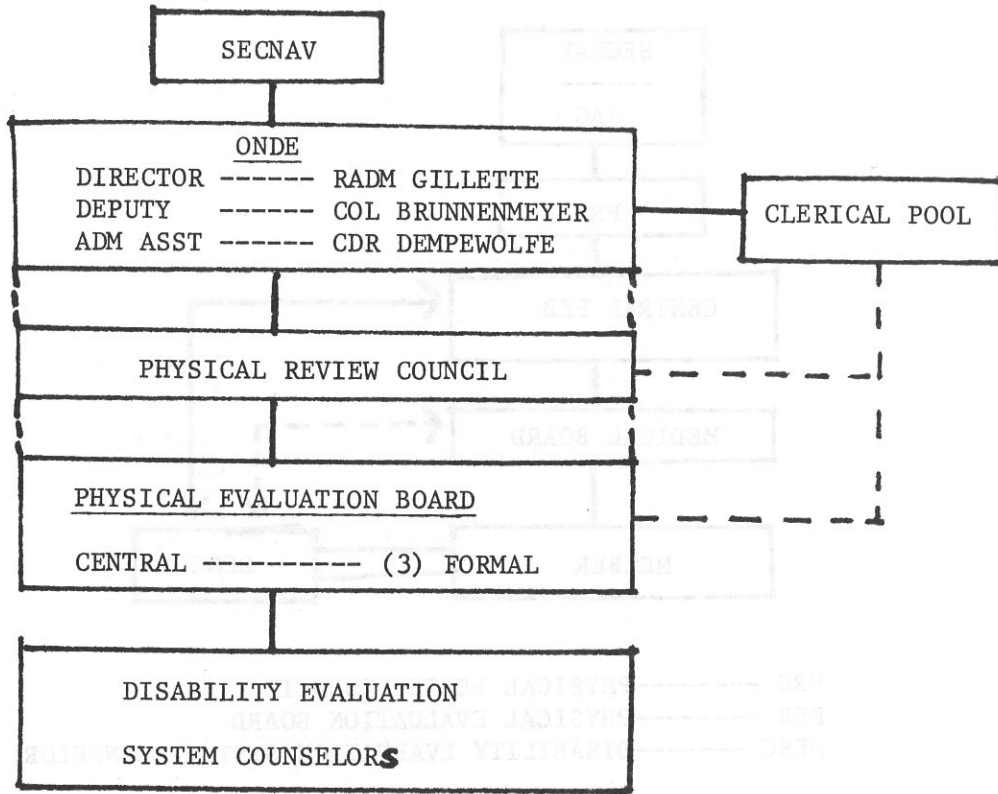


FIG. 4

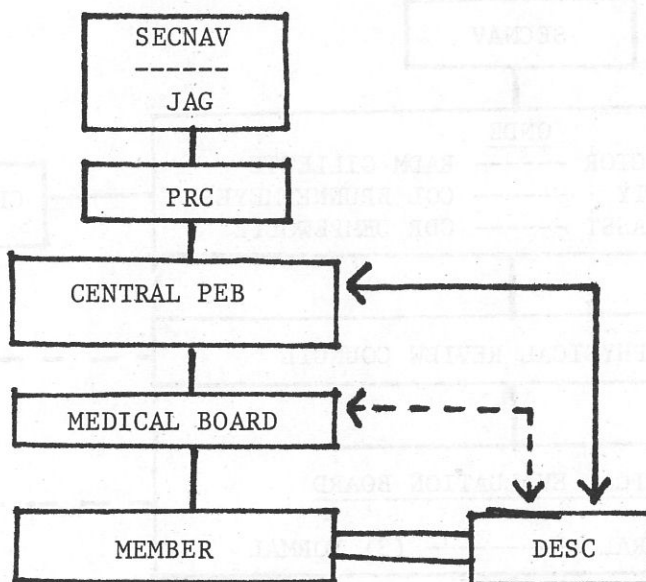
longer occur. Experience has shown that only a relatively small number of cases demand a full and fair hearing; we have therefore established three boards, one in San Diego, one in Great Lakes, and one in Bethesda, which will hold full and fair hearings only. Incidentally the full and fair boards will consist of a medical member, one Navy line and one Marine member. This entire new system requires only a total of 27 officers, Navy and Marine, as compared to a minimum of 41 officers if assigned on a full time basis under the old system. Unfortunately, under the old system very few officers were assigned on a full time basis. Under the new system, all personnel are assigned on a full time basis.

One innovation which we hope will influence the new system to the greatest degree, if it is properly done, is the counseling service. Up to this time, such service was not properly performed in the Navy, at least not as a concerted effort. Therefore, we have placed at 12 major hospitals, senior Navy and Marine enlisted men to commence counseling at the time when it appears that a member will enter the Disability Evaluation System. At the smaller hospitals, this duty will be performed by a member of the

hospital staff. A counseling manual has been written and is currently being printed to assist in this effort. Specifically the party who is about to enter the disability evaluation system will have the whole system explained to him, he will be kept informed of the action taken in his case, and what those actions mean. These counselors are not to advise but they are to inform. We hope that every disabled member passing through the disability system will fully understand that system and the reasoning behind the proposed actions. We feel we owe it to our sailors and marines to make sure that we do for them everything to which they are entitled.

Now, how will this system function? After a wounded or ill sailor or marine has attained the maximum benefits of hospitalization, and if there is a question concerning his fitness for continued military service, his case will be considered by a board of medical officers, the Medical Board. If this board recommends appearance before a Physical Evaluation Board, counseling service commences. The party receives an explanation of how the system works and what his rights are. In the meantime, the Medical Board has been forwarded to the centrally located

ACCEPTANCE OF CPEB FINDINGS



PRC -----PHYSICAL REVIEW COUNCIL
 PEB -----PHYSICAL EVALUATION BOARD
 DESC -----DISABILITY EVALUATION SYSTEM COUNSELOR

FIG. 5

Physical Evaluation Board in Washington. That board will make a prima facie recommendation and, utilizing telephone or message traffic, will transmit the proposed findings to the counselor. The counselor in turn will present these recommendations to the member, explaining to him what the proposal means in dollars and cents and other benefits, and again counseling him on his rights. Should the member concerned accept the prima facie recommendations, such acceptance will be forwarded speedily to the Central Physical Evaluation Board in Washington. After review by the Physical Review Council, final action can be taken. (Fig. 5)

Should the party concerned choose to not concur in the recommendations of the prima facie findings of the Physical Evaluation Board, a full and fair hearing will be held. If the party so desires, he has the right to appear in person or he can be represented by counsel. The case is then referred to a formal or field board. Here the man has the opportunity to call witnesses, testify on his own behalf and introduce other testimony. This board then renders its own proposed findings; again the Physical Review Council will review these findings and in case it does

agree, the case again goes to the Secretary for final action. However, should the party not accept or should there be any other controversy such as disagreement between Physical Evaluation Board and Physical Review Council, the case goes for resolution to the Physical Disability Review Board. The provision for this appellate review, and the provision for the legal review by JAG prior to final action by the Secretary, have not been disturbed by the new organization. (Fig. 6)

Now what do we hope to achieve with this new system? Our goal of course is to aid and assist our disabled sailors or marines. In the past when a man's case entered the system, the waiting period not infrequently was in excess of 90 days, that is counting the time from the date the case was referred to a Physical Evaluation Board until action was directed by the Secretary. A variety of things entered into this undue delay such as paper shuffling delays, delays generated by the man because of improper counseling and consequent misunderstanding of the system, and not the least of these, by inequities arising within the system because of the lack of centralized direction. We believe that the innovations outlined above

NONACCEPTANCE OF CPEB FINDINGS

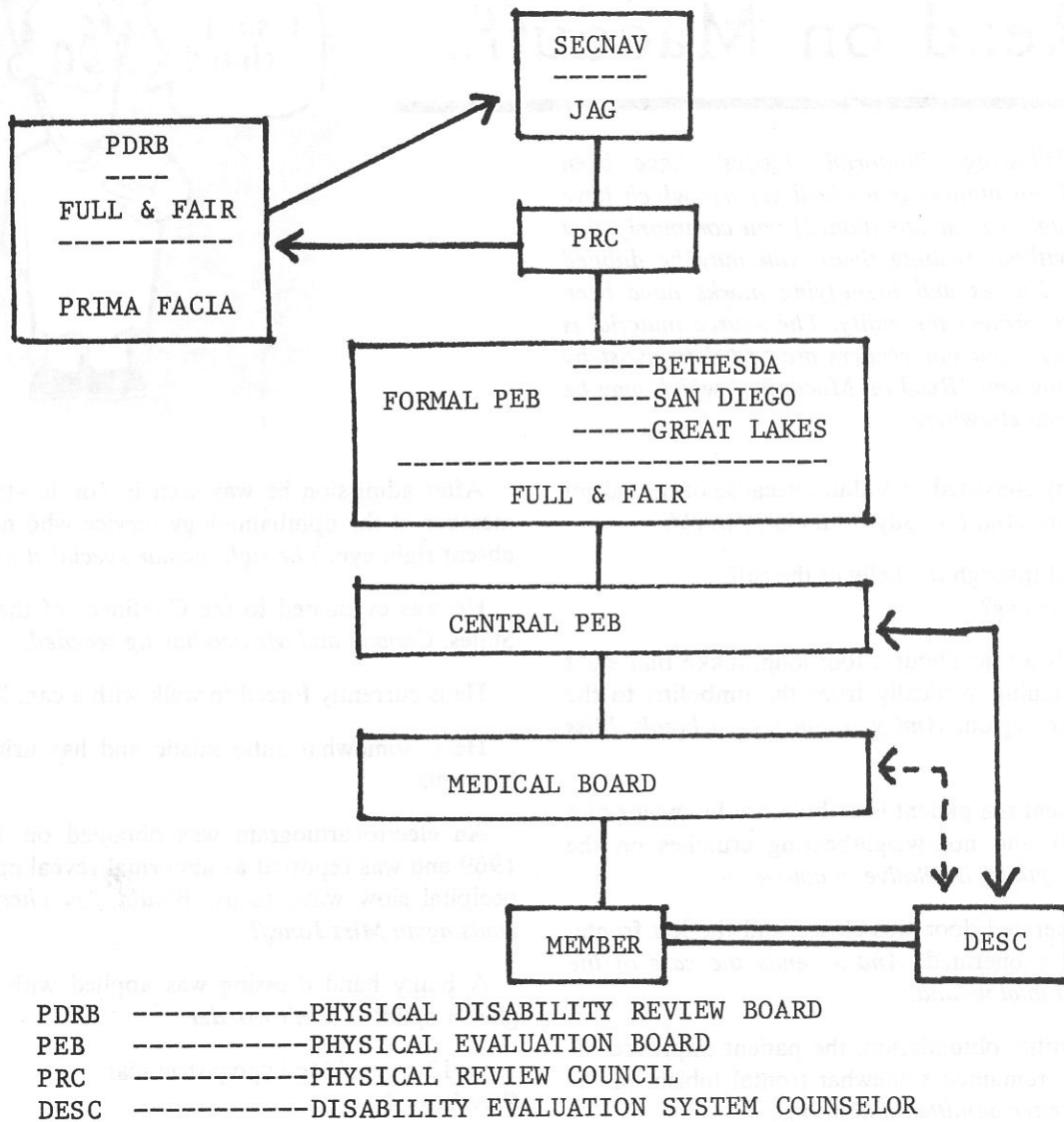


FIG. 6

will reduce this average time in the system to about 45 days or less. For the man concerned, the advantage of a more rapid processing through the disability evaluation system is obvious. His waiting time is shortened, he can make plans earlier for his future and he can begin receiving the often higher monetary compensations offered by the Veterans Administration. For the government there is also an advantage. For instance, based on the case load of 1969 where approximately 14,000 PEB cases were received, a total of 2,700 man years would have been saved had these cases been processed within a 45-day period. Another advantage anticipated is that we ought to achieve fairer and

more uniform decisions by utilizing only full time personnel. As mentioned earlier, under the old system many members were assigned to duty in the system on a collateral duty basis. Lack of knowledge, familiarity and understanding have contributed unfavorably. Further, a fully coordinated and positively directive counseling system has now been introduced as opposed to a somewhat lackadaisical and haphazardous counseling system that was, at times, encountered in the past.

The Office of Naval Disability Evaluation became legitimate and functional on October 1. I believe that this office will enable us to improve the service afforded our disabled sailors and marines. ☸

Read on Macduff...

The following "immortal classics" have been gleaned from numerous medical reports which have been brought to our attention. If you commonly sign reports without reading them, you may be dubbed Macduff. Names and identifying marks have been omitted to protect the guilty. The source material is so extensive that our readers are urged to assist by contributing any "Read on Macduff's" which may be encountered elsewhere.

Therapy consisted of Valium because of periods of belligerents. *And they say it's a man's world.*

... wound through the belly of the calf. . .
Bovine practice?

There is a scar about a foot long, make that eight inches, running vertically from the umbolitis to the suprapubic region. *And you can take a break, Miss Jones.*

At present the patient is ambulatory by means of a wheelchair and non-weightbearing crutches on the right. *Everything is relative of course.*

The lacerated door was closed and the left frontal sinus was exonerated. *And so ends the case of the accused cranial wound.*

After initial obtundation, the patient improved although he remained somewhat frontal lobish. *Medicine does have admitted limitations.*

... multiple rediclocations. . . *For the woman who has everything.*

Patient skin tested for TBC. If skin test for PPD is negative no further Rx needed. If positive then please return to us and we shall evacuate. *Dispensaries may come and go, but hail to the men who can make decisions.*

He complained of a fecal inconsistency.

Auscultation of the heart revealed no murmurs and the testes were small. *The ultimate in stethoscopes.*

The left hand is held in an attitude of the sign of benediction.



After admission he was seen in consultation by a member of the ophthalmology service who noted the absent right eye. *The right ocular specialist no doubt.*

He was evacuated to the Continent of the United States. *Canada and Mexico having seceded.*

He is currently forced to walk with a can. *Tin?*

He is somewhat antagonistic and has urinated in his pants.

An electrocardiogram was obtained on 19 June 1969 and was reported as abnormal revealing a right occipital slow wave focus. *Would you check those leads again Miss Jones?*

A bulky hand dressing was applied with a volar plaster splint. *I don't wonder.*

... a 13 cm smiling hypogastric scar. . .
Stay happy!

The patient was wounded in the right distal foreleg. *The veterinarian is back.*

The patient's wounds were debrided in Viet Nam and his leg placed in a posterior splint. He was then evacuated to the CONUS. *Under separate cover we presume.*

The patient has complained of less diplopia. *Of course one never misses what one never had.*

The patient has a chronic recurrent disease for which there is no cure. His control has been erotic.

Cultures of the sputum, nasogastric aspirate, bone marrow, and urine were negative for manufacturing tuberculosis. ☘

A TISSUE CULTURE SYSTEM FOR THE STUDY OF DRUG ACTION AGAINST THE TISSUE PHASE OF MALARIA

R. L. Beaudoin, C. P. A. Strome, W. G. Clutter, Department of Parasitology, Naval Medical Research Institute, Bethesda, Maryland 20014. *Milit Med* 134(10): 979-985, September 1969.

Tissue culture provides a logical approach to the problem of studying the action of drugs on the exoerythrocytic parasites of malaria. Besides being relatively inexpensive, it furnishes a means of directly studying the effects of the drug on the target organism.

Attempts at *in vitro* culture of the exoerythrocytic stages have met with varied success. Although reports of attempts to use *in vitro* techniques to study drug action have appeared simultaneously with the first successes at maintaining the parasites, it was not until Davis *et al.* improved the methods for growing exoerythrocytic parasites in serial passage that the system could be adapted for extensive and efficient use in routine or intensive drug studies.

Materials and Methods

Although the basic method reported by Davis *et al.* was followed, it was adapted for drug studies by addition to or modification of existing techniques.

The studies are carried out in Leighton tubes fitted with 11 X 22 mm coverslips. Two or three tissue culture chambers (8-oz. bottles) with full sheets of turkey cells derived from embryonic brain with a minimum of 50 percent of the cells infected with the exoerythrocytic stages of *P. fallax* are usually adequate to provide sufficient inoculum to seed approximately 50 Leighton tubes. The sheet of cells is detached by a 0.25 percent trypsin solution in Hanks' BSS. The contents of the bottles are pooled and centrifuged at 1000 rpm for 10 minutes at room temperature. The supernatant is discarded and the parasitized cells are resuspended in enriched medium (Table I). An estimate of the number of viable cells present is made by counting an aliquot supravitaly stained with trypan blue in a W.B.C. blood counting

TABLE I
COMPONENTS OF MEDIUM

mg/L		mg/L	
NaCl	6800.0	L-Glutamine	292.0
KCl	400.0	Biotin	1.0
NaH ₂ PO ₄ ·H ₂ O	140.0	Folic acid	1.0
MgSO ₄ ·7H ₂ O	200.0	Choline Cl	1.0
CaCl ₂ (anhyd.)	200.0	Nicotinamide	1.0
Glucose	1000.0	D-Ca pantothenate	1.0
L-Arginine HCl	21.0	Pyridoxal HCl	1.0
L-Cystine	12.0	Thiamine HCl	1.0
L-Tyrosine	18.0	Riboflavin	0.10
L-Histidine	8.0	i-Inositol	1.80
L-Isoleucine	26.0	Phenol red	10.0
L-Leucine	26.0	NaHCO ₃	2200.0
L-Lysine	26.0		ml/L
L-Methionine	7.50	Calf serum	100.0
L-Phenylalanine	16.50	Folinic acid	
L-Threonine	24.0	(10 ⁻⁶ M solution)	10.0
L-Tryptophan	4.0	Penicillin-streptomycin	
L-Valine	23.50	solution (5,000	
		units ea/ml)	10.0

chamber. The volume of the inoculum is adjusted so that each of the Leighton tubes receives 200,000 viable cells suspended in 1 ml of the medium. The Leighton tube cultures are then incubated at 37°C. in 5 percent CO₂ and air atmosphere for 24 hours during which the cells will flatten, attach and grow on to the coverslip. The medium is removed and replaced by test medium to which the drug has been added in suitable concentration. The activity of any drug is determined by titration in these cultures. Cultures are randomly divided into groups of 4 or 6, with each experimental group receiving a different dilution of the drug and the control tubes receiving the drug vehicle. The medium containing the drug is allowed to remain on the parasitized cell sheet for 48 hours. The coverslips are removed, wet fixed in Zenker's formalin (90 percent Zenker's stock to 10 percent neutral formalin) for 5-15 minutes, washed

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The opinions and assertions contained herein are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the Naval service at large.

in four changes of distilled water for 30 minutes, placed in Lugol's solution (1 percent I, 2 percent KI) for 10 minutes to remove the mercury, transferred to 10 percent sodium thiosulfate to remove the Lugol's solution, washed in two additional washes of distilled water, rinsed in phosphate/carbonate buffer (pH 6.8), stained in Giemsa's solution diluted 1:10 in buffer for 30 minutes, rinsed once more in buffer, air dried and mounted in Permount with the glass side up. Drug and control tubes are randomized and coded. Each precoded preparation is evaluated for evidence of drug action.

The basis for evaluating the cultures is strictly parasite morphology. Any culture consistently showing pathological changes in the parasites is considered positive for drug activity. Effective dose endpoints are calculated by the method of Reed and Muench.

Photomicrographs are taken through the oil immersion (97X) objective of a Leitz Ortholux microscope using 35mm Kodachrome II professional type A film.

Results

The stages of the exoerythrocytic cycle as they appear in control tubes are in Figs. 1-6 (not shown). Fig. 1 is a mature trophozoite just prior to nuclear division within a fibroblast-like host cell derived from turkey brain. Fig. 2 shows an early segmenter following the first few nuclear divisions. Mature schizonts can be seen in Fig. 3. Although there is wide variation in the size of the individual schizonts and in the number of merozoites produced by a schizont, the three in Fig. 3 are representative.

Fig. 4 affords a lateral view of merozoites clearly showing their teardrop shape and small size. The merozoites in the large segmenter are fully developed and are identical in appearance to merozoites released from the host cell. Multiple infected cells are usual (Figs. 5-6) and the parasites within a single host cell are commonly at the same stage of development, an indication that they entered the cell at approximately the same time. In Fig. 6 a number of parasites are undergoing nuclear division, an occurrence rarely observed, probably because of the rapidity of the process.

The remainder of the figures illustrate the changes observed in parasites from experimental tubes following exposure to drugs.

Two types of lesions were encountered when antimalarials were added to the culture medium. One was the appearance of large vacuoles within the

cytoplasm of the parasites. This lesion, referred to as a type I lesion, is observed when parasites are treated with 8-amino-quinolines (including primaquine, pentamquine, a pentamquine metabolite,* and isopentamquine), a naphthoquinone** and RC12.***

The lesion begins as a thinning of the cytoplasm and grows until it forms a vacuole which in the advanced condition may have enlarged until it completely replaces the cytoplasmic substance of the parasite.

In younger parasites only a single vacuole is observed while the older parasites usually form several. Fig. 7 illustrates a large vacuole formed in each of two young trophozoites following exposure to primaquine. The vacuole has enlarged until the nucleolus is the sole identifiable stained structure remaining. In schizogonous stages, several vacuoles are characteristically formed (Fig. 8). They often assume a central position and crowd the remaining cytoplasm and the stained portions of the nucleus to the periphery (Fig. 9).

In some experiments the cultures were incubated for an additional 72 hours after the drug was removed to test whether the lesions observed were fatal to the parasites. Although few or no parasites could be found in most cultures, occasionally survivors were encountered. These often showed the characteristic lesion (Fig. 10) and invariably appeared stunted in growth. Thus, the trophozoites in Fig. 10 are significantly small than trophozoites normally encountered in control cultures, and the mature segmenter in Fig. 11 contains a much reduced number of merozoites. Type I lesions also occurred in parasites exposed to WR 49808 (Fig. 12) and WR 27653 (RC12) (Fig. 13).

A second type of morphological change was observed in the parasite when pyrimethamine was added to the cultures. This effect was likewise repeated with an experimental drug (WR69320)† and was designated as a type II lesion.

The type II lesion consists of both nuclear and cytoplasmic changes. The initial morphological change involves a modification in the staining property of the nucleus, and is characterized by an enlarged, rounded, darkly-stained nucleolus somewhat translucent in appearance (Fig. 14). Some nucleoli

*WR49577—8[(5-/isopropylamino/pentyl) amino]—5, 6-quinolinediol trihydrobromide.

**WR49808—3-/8-Cyclohexyloctyl/-4-hydroxyl-1, 4-naphthoquinone.

***WR27653—4-(2-Bromo-4, 5-dimethoxyphenyl)-1, 1, 7, 7-tetraethylene-triamine.

†WR69320 is a commercially discrete compound whose structure has not yet been released.

appear to fragment into tiny uneven particles (Fig. 15). In advanced stages of the lesion there is a change in density of the stained cytoplasm accompanied by what appears by light microscopy to be a loss in membrane integrity (Fig. 14). Only older stages of the parasite were seen and apparently all of these are affected.

The relative effectiveness of the drugs studied is given in Table II. Values are recorded as the ED₅₀ (effective dose for 50 percent of the preparations evaluated).

Discussion

A tissue culture system suitable to study the action of drugs against the tissue stages of malaria is a goal which has been sought for many years. Despite early success in this area the methods have never gained wide acceptance due to the technical difficulties surrounding *in vitro* culture of the malarial parasite. These obstacles were only gradually overcome until finally Davis *et al.* reported that the exoerythrocytic parasites of *P. fallax* can be routinely grown *in vitro* in copious numbers in cells derived from embryonic turkey brains. This system has now been modified and adapted for use in chemotherapy studies.

The 8-amino-quinolines and pyrimethamine, drugs of proven effectiveness against the exoerythrocytic parasites, were used in evaluating the system. These compounds all showed activity against the parasites *in vitro*, although the effects of the antifolate differed qualitatively from that of the 8-amino-quinolines. Quantitative differences in the levels required to demonstrate activity were found even within a class of drug such as the 8-amino-quinolines. Thus, while each of the 8-amino-quinolines produced a specific lesion, the concentrations required to produce the effect varied considerably within the series.

The study was also extended to several experimental drugs, including a naphthoquinone, RC12 and WR69320. The first two compounds produced effects very similar to those effects observed with the primaquine series, a type I lesion. The changes observed with WR69320 on the other hand were indistinguishable for those caused by pyrimethamine.

Beaudoin and Aikawa reported that the vacuoles appearing in the cytoplasm of parasites treated with primaquine were actually swollen mitochondria. This agrees with the observation that in young parasites where only one mitochondrion occurs a single vacuole only is formed, while several are usually seen in older stages of the parasite which commonly have several mitochondria. Aikawa and Beaudoin have

TABLE II
COMPARISON OF THE LEVEL OF ACTIVITY OF ANTI-MALARIAL DRUGS AGAINST THE TISSUE STAGES OF *P. fallax in vitro*

WR#	Drug	Number of Replicate Trials	Type of Lesion	ED ₅₀ mg/L
2975	Primaquine	14	I	5.30
6021	Pentaquine	3	I	3.15
6020	Isopentaquine	2	I	6.70
49577	Metabolite ¹	3	I	2.30
49808	Naphthoquinone ²	2	I	<0.50
27653	RC12 ³	2	I	4.40
2978	Pyrimethamine	3	II	0.54
69320	Experimental drug ⁴	2	II	<0.10

¹ WR49577—8[(5-/isopropylamino/pentyl) amino]-5,6-quinolinediol trihydrobromide.

² WR49808—3-/8-Cyclohexyloctyl/-4-hydroxy-1,4-naphthoquinone.

³ WR27653 — 4-(2-Bromo-4,5-dimethoxyphenyl)-1,1,7,7-tetraethylenetriamine.

⁴ WR69320—Commercially discrete compound.

further extended the study of the site of action of the 8-amino-quinolines to include detailed studies by electron microscopy of the effects of primaquine, pentaquine, isopentaquine, and WR49577. They conclude that the primary effect of all three drugs is similar to that reported earlier for primaquine. The observation that the primary site of action of the 8-amino-quinolines is the mitochondrion suggests that the drugs may have their effect on the energy-producing pathways of oxidative phosphorylation and the electron transport system. Certainly, the extent of the swelling would be sufficient to disrupt coupled reactions which are dependent on the structural integrity of this organelle.

The marked stunting observed in surviving parasites three days after removal of drugs of the primaquine series is consistent with the suggestion that the parasites have suffered impairment of their energy-producing mechanisms. In this regard it is interesting to note that mitochondrial swelling of the malarial parasite related to primaquine treatment may be at least partially irreversible since young parasites still showed vacuoles as late as three days after withdrawal of the drug.

The appearance of a similar lesion in parasites exposed to the naphthoquinone and RC12 certainly deserves further study, especially in view of the known antirespiratory activity of the former and its structural similarities to coenzyme Q. Whether these

drugs have the same locus of action as the 8-aminoquinolines must await further study, although preliminary observations of the ultrastructure suggests that naphthoquinone causes similar as well as additional changes in the parasites. RC12 effects have not yet been studied by electron microscopy.

The changes seen with pyrimethamine and WR69320 were compatible with the reported mode of action for folinic acid pathway antagonists. Although both cytoplasmic and nuclear changes were noted we speculate that the primary changes involve interference with nuclear organization. The nucleus appears disorganized and fragmented soon after exposure to drugs. This nuclear effect is interpreted as the cause of the cytoplasmic changes which lead eventually to a loss of cytoplasmic definition and integrity.

Thurston reported that proguanil and sulphadiazine, which likewise interfere with folinic acid pathways, cause the nuclei of the erythrocytic stages of *P. berghei* to break up into unequal pieces. She concludes that these drugs act chiefly on the nuclei of early schizonts and that the cytoplasmic changes seen at 30 to 40 hours are caused by the drugs acting as general cytoplasmic poisons.

Aikawa and Beaudoin using electron microscopy found that pyrimethamine interrupts nuclear division of the erythrocytic stages of *P. gallinaceum* apparently at late metaphase. However, no striking cytoplasmic changes were noted at least in the first 15 hours.

It seems logical to conclude that severe disruption of nuclear function would result in pathological lesions within the cytoplasm of the parasite. The fact that only certain specific stages of the parasite, late trophozoite and immature schizonts were observed suggests that stages not actively engaged in nuclear replication are unaffected and continue to develop until they reach that stage in the life cycle. However, timed studies of the action of this drug upon the parasites are needed before this point can be proven.

Our findings confirm once again that exogenous folinic acid does not overcome the chemotherapeutic effects of this group of drugs. The reasons for this are not well understood.

Preliminary observations by electron microscopy by pyrimethamine treated tissue cultures of exoerythrocytic parasites of *P. fallax* failed to reveal parasites in arrested nuclear division. Mitotic apparatus such as nuclear microtubules and centriolar plaques are apparent when the erythrocytic stages of *P. gallinaceum* are treated with this drug. This may reflect a difference in the action of pyrimethamine between erythrocytic and exoerythrocytic parasites which requires further study.

Summary

A tissue culture system for studying the action of antimalarial drugs on the exoerythrocytic cycle of malaria is described. Both quantitative and qualitative comparative data on the effects of the drugs were obtained. Two types of changes were observed in parasites incubated in the presence of drugs.

Primaquine and certain related drugs caused the formation of large vacuoles in the cytoplasm of the parasite. Folinic acid antagonists on the other hand caused a disorganization of the nucleus of schizontous parasites followed by a loss of definition in the parasites' cytoplasm.

Acknowledgments

The authors thank Drs. D. E. Jacobus and M. Aikawa for their assistance in different phases of the study. They also thank Mr. F. Mitchell, Miss L. Powell and Mrs. K. Brown for their assistance in the technical aspects of the study.

(The figures and references may be seen in the original article.)

In a Bulletin of the American Medical Writers Association, Captain Carvel Blair attacked Navy "officialese." He quoted the following horrible example: "Upon arrival in the theatre of operations an over-view of the environment was conducted and the conflict situation was subsequently resolved in my favor." Caesar said it better: "Veni, vidi, vici."

GASTROINTESTINAL DISORDERS IN VIETNAM RETURNEES

LCDR Julian Katz,* MC, Naval Hospital, Boston, Chelsea, Massachusetts.

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More Americans in Southeast Asia seek medical aid for diarrhea than for trauma. Intestinal parasites are endemic to this part of the world and hookworm is prevalent. Amebiasis has not been frequent among Vietnam returnees. Tropical sprue has been uncommon. Malaria with gastrointestinal manifestations is a serious problem in this region.

Gastrointestinal disorders are common in Americans who have been in Southeast Asia. A review of the experience of the gastroenterology service at the Naval Hospital in Chelsea, Massachusetts, the major military facility in New England, points out some of the problems which may be encountered. Parasitic and other infectious diseases which are endemic to Southeast Asia are usually recognized and treated before the affected persons return to the United States. Because of the rapidity of evacuation, however, a man may be in a bed in our hospital 36 hours after having been in a rice paddy or jungle in Vietnam.

Intestinal parasites are detected in the stools of persons returning from Southeast Asia. *Giardia lamblia* is found occasionally but is rarely associated with gastrointestinal symptoms. Infection with worms such as *Ascaris* and *Strongyloides stercoralis* also occurs (table 1).

Table 1. Intestinal Parasites
Found in Vietnam Returnees

1. *Giardia lamblia*
2. *Entamoeba histolytica*
3. Hookworm
4. Roundworm (*Ascaris*)
5. *Strongyloides stercoralis*

The true incidence of infection with *Entamoeba histolytica* (table 2) in Vietnam has not been determined because of difficulties in establishing the diag-

nosis. Nevertheless, amebiasis has not been a frequent problem in patients evacuated to our hospital. Diagnosis of amebic dysentery is made by the recognition of motile trophozoites in fresh diarrheal stool or in material obtained at proctoscopy. The disease is usually acquired through a breakdown in sanitation control. Two Marines seen recently, for example, acquired it after drinking rice paddy water. Abdominal distress and bowel upsets, usually mild, are associated with chronic intestinal amebiasis, and ameboma may be mistaken for colonic cancer. The radioisotope liver scan is valuable for demonstrating a liver abscess.

Table 2. Types of *Entamoeba*
Histolytica Infection

1. Amebic dysentery
2. Chronic intestinal amebiasis
3. Ameboma
4. Extraintestinal complications
 - a. Liver involvement
 - b. Abscess or peritonitis

Hookworm is prevalent in Southeast Asia, and the diagnosis depends on identification of the typical eggs. In some cases, however, direct examination of the stool and concentration methods do not establish the diagnosis and a therapeutic trial is indicated (table 3). The case of a 22 year old infantryman illustrates our experience with three patients. He had been in Vietnam for almost one year and had felt unusually tired for three months. His hematocrit reading was 30 percent and iron deficiency was present. Nine percent of his white blood cells were eosinophils. Gastrointestinal X-ray films were unremarkable except for prominent duodenal folds. Stool tests for occult blood were persistently positive. Tetrachloroethylene was administered despite the inability to demonstrate hookworm eggs. Five days later the stools were negative for blood. The hematocrit reading has become normal, and gastrointestinal bleeding is no longer present. Although tetrachloroethylene was used, bphenium may be preferable.

*Dr. Katz was a gastroenterologist at the Naval Hospital, Boston, Chelsea, Massachusetts. He is now attending physician, Graduate Hospital of the University of Pennsylvania, and member of the faculty, University of Pennsylvania School of Medicine, Philadelphia.

Table 3. Findings Suggesting Possible Hookworm Infection

1. Iron-deficiency anemia
2. Eosinophilia
3. X-ray evidence of prominent duodenal folds
4. Stools positive for occult blood
5. Response to treatment (tetrachloroethylene, bphenium)

More Americans in Southeast Asia seek medical aid for diarrhea than for trauma. The Bureau of Medicine and Surgery endorses an estimate that over 50 percent of all personnel arriving in Vietnam have a bout of diarrhea in the first 60 days. In our experience practically everyone has had at least one episode during his tour. In most cases the agent responsible is not identified. Although outbreaks of shigellosis and salmonellosis occur among our troops, in the past year our laboratory has rarely isolated any pathogenic bacteria from the stools of Vietnam returnees.

In some patients episodes of presumably infectious diarrhea have been followed by persistence of loose, frequent bowel movements, particularly after meals. These patients have had an initial weight loss of about 10 lbs but have generally felt well. The bowel movements have lessened in number but the stools are still not fully formed. Laboratory studies have shown no malabsorption or other cause for the diarrhea, and biopsy of the small bowel has been negative. Treatment has consisted of dietary restriction, particularly of raw fruits and vegetables, and administration of a mucilloid bulk agent. Possible causes include changes in bowel flora due to the initial infection or its treatment, disturbances in intestinal motility, and alterations in digestive enzymes.

Tropical sprue is said to be endemic in Southeast Asia, but few cases have been seen among our troops. We have not seen any patients with malabsorption syndrome due to tropical sprue. In fact, a nurse and an army sergeant who returned from the tropics with malabsorption had nontropical sprue or gluten-sensitive enteropathy. The frequent use of antibiotics among our troops and their adequate nutrition may explain the rarity of this disorder.

Malaria is a serious problem in Vietnam and is complicated by the existence of strains of the parasite which are resistant to the usual antimalarials. Malaria is appearing in Americans after their return from Vietnam or even months after their discharge from military service. Falciparum malaria in particu-

lar may produce a variety of signs and symptoms, and gastrointestinal problems occur with the first attack in at least one-third of cases (table 4).

Table 4. Gastrointestinal Symptoms in Malaria

1. Diarrhea
2. Abdominal pain
3. Nausea and vomiting
4. Hematemesis
5. Ileus
6. Bloody stools

The case of a 19 year old Marine illustrates some of the gastrointestinal manifestations of malaria. He was hit in the right hand by mortar shrapnel and was evacuated to our hospital. Ten days later he experienced profound watery diarrhea and then bloody diarrhea, severe abdominal pain, and vomiting and his temperature spiked to 104° F. Jaundice and abdominal distention and tenderness were present, bowel sounds were decreased, and the liver and spleen were palpable. A peripheral blood smear showed multiple trophozoites in red blood cells.

The abdominal symptoms in malaria have several causes. During the septicemic phase of falciparum malaria the small mucosal vessels become engorged by sludging of the adhesive, parasitized red cells. Intravascular coagulation occurs and there may be multiple hemorrhagic foci throughout the gastrointestinal tract. When shock is present, the larger vessels supplying the intestine may thrombose, with subsequent infarction. Splenic and hepatic distention may produce abdominal discomfort. Rarely the rapid splenic distention leads to rupture.

Predictably, the majority of gastrointestinal disorders seen in Americans returning from Southeast Asia are similar to those seen in usual practice. Peptic ulcer disease and irritable bowel syndromes are encountered often. Since fresh milk is virtually unobtainable in Vietnam, servicemen returning home are likely to consume large amounts of milk and milk products. Some have been troubled with gaseousness and diarrhea. In these men, intestinal lactase insufficiency has become symptomatic with an increased lactose intake. Americans returning with ulcerative colitis and Crohn's disease usually say that their symptoms began after an acute episode of dysentery. Sixty percent of the cases of inflammatory disease of the colon are clinically and radiographically of the granulomatous variety.

Periods of extraordinary stress are common in Southeast Asia. The importance of knowing the circumstances of a patient's military service is illustrated by the case of a young Marine who was evacuated from Vietnam to our hospital because of persistent abdominal pain and vomiting. He had been in the field in Vietnam for 10 months but claimed that "there just wasn't any action." The abdominal pain had begun while he was hospitalized for bacillary dysentery. In our hospital all studies were negative except for high gastric acidity. The pain and vomiting were intractable to medical therapeutic measures. It was brought out during one of our discussions that while the patient was in the hospital recovering from dysentery one of his buddies was carried in and he learned that the rest of his platoon had been killed. His gastrointestinal symptoms lessened with supportive care but he was unable to complete his period of enlistment and has had a difficult time in civilian life.

Summary

Parasitic and other infectious diseases which are endemic to Southeast Asia are usually recognized

and treated before the affected persons return to the United States. Intestinal parasitic infections do occur and persistent gastrointestinal bleeding may be caused by hookworm infection. After an episode of infectious diarrhea there is often a prolonged change in bowel habits, a functional postdysenteric state. Malaria must be considered as a cause of fever and abdominal complaints in all patients who have been in Southeast Asia.

ACKNOWLEDGEMENT

I am indebted to Sheila Sue Katz, MD and Commander Ronald Schwartz, MC USN, for help in preparation of this report.

Presented in part before the fiftieth annual session of the American College of Physicians at Chicago.

The views expressed are those of the author and do not necessarily reflect the views of the United States Navy or Department of Defense.

Office address: 1830 Rittenhouse Square, Philadelphia, Pa. 19103.

(The references may be seen in the original article).☸

Malfuction of Heart Pacemakers

In the May 18, 1970 issue of the Journal of the American Medical Association (Vol. 212, No. 7) five doctors from Chicago and Detroit report on four patients using implanted pacemakers encountering a microwave oven. One patient fainted and the other three had disturbances of normal heart rhythms. They warn that an encounter between the two devices may be dangerous.

"The increased use of microwave ovens and pacemakers which are designed to sense cardiac electrical signals makes clear the likelihood of hazardous encounters of the two electronic devices," the doctors stated. They noted the increasing use of microwave ovens in restaurants, canteens, airlines, trains and private homes. "Patients with such pacemakers must be advised of this danger," they comment.

Naval Ships and Stations with powerful radio-frequency and microwave (radar) generating devices should also be aware of this phenomenon, since they are frequently hosts to senior citizens with pacemakers.—Code 742, BuMed.☸



HURRICANE CELIA

Through the courtesy of Naval Hospital, Corpus Christi, Texas

Shortly after 1400 on 3 August 1970, hurricane Celia struck the Corpus Christi, Texas, area. Compared to other hurricanes, Celia was quite unusual. Normally expected heavy rains and gusty winds did not precede her arrival. Celia was relatively small in diameter and only unleashed her fury and destruction for approximately four hours, but she dealt the Corpus Christi area a devastating blow.

The Naval Hospital suffered gross, massive damage from this unfriendly lady. *No personnel casualties were experienced at the Naval Hospital.* Early tracking reports of Celia indicated that she would come ashore some distance north of Corpus Christi. The wind velocities were reported to be 90–110

mph. However, later tracking reports indicated that this fickle lady would pass directly over the Corpus Christi area; therefore the hospital set Hurricane Condition 1 in early morning, 3 August.

The basic disaster preparation concepts outlined in the Hospital's Disaster Plan proved to be sound. Unfortunately though, no activity can take measures sufficient to prevent destruction to major structures when faced with a disaster as severe as Celia. The usual preparations were carried out; windows were taped; shutters were secured; equipment and records were stored to minimize water damage; a refugee center was activated; if not medically contraindicated, ambulatory patients who resided in the local





Front of Admin. Bldg. H-1



North Side, Bldg. H-1

area were released to home; expectant mothers in the ninth month of pregnancy were encouraged to report to the hospital; Hurricane Boxes were distributed; water for drinking purposes was drawn and stored; nonessential staff personnel were released to care for their homes and families.

During the height of the storm, individual areas of the hospital were manned by key personnel to ensure effective function independent of Command guidance if the situation demanded. Since all communications were shortly disrupted, this proved to be a vital maneuver. Loss of the Administration Building roof, heavy rains, flying debris, and progressive damage forced the Commanding Officer to successively move his Command Post from the OOD's office to the (1) Master-at-Arms Office (2) Office Services Office, and (3) X-ray Department; however, the X-ray Department was soon damaged to the extent that further relocation of the Command Post in Central Surgical Supply Room was required. Radio communication

was disabled at the time the OOD's office was damaged. With all communication disrupted the alternative sites of the Command Post could not be relayed to other areas of the hospital, or to Commander Disaster Control Group 8.3 Naval Air Station. Consequently, many hospital areas functioned independently until wind velocity subsided to a degree that permitted establishment of personal communications.

Immediately after the winds subsided below hurricane force, a quick assessment revealed damage to all hospital structures. The Administration Building, Operating Room, X-ray Dept., and many wards received major damage. Roof and window losses permitted water to enter virtually every hospital space, rendering essential equipment inoperative. All utilities were lost; there was no water supply, gas, steam, or electrical power except for that provided by one emergency generator. Three of the four installed generators were disabled. The remaining generator provided emergency power for the Intensive Care Unit.



Overhead in Nursing Super. Office, Bldg. H-1



Driveway between H-1 and H-2

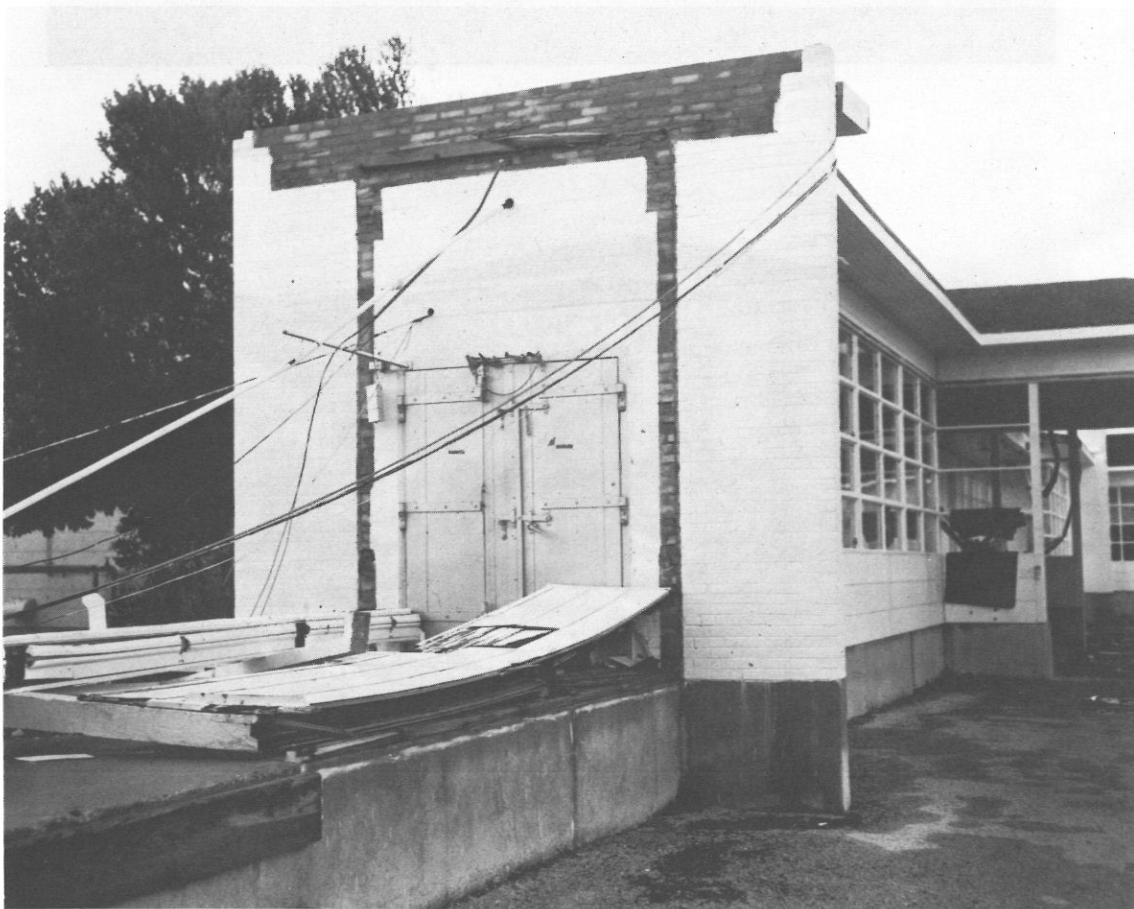


Front of X-ray Dept., H-2

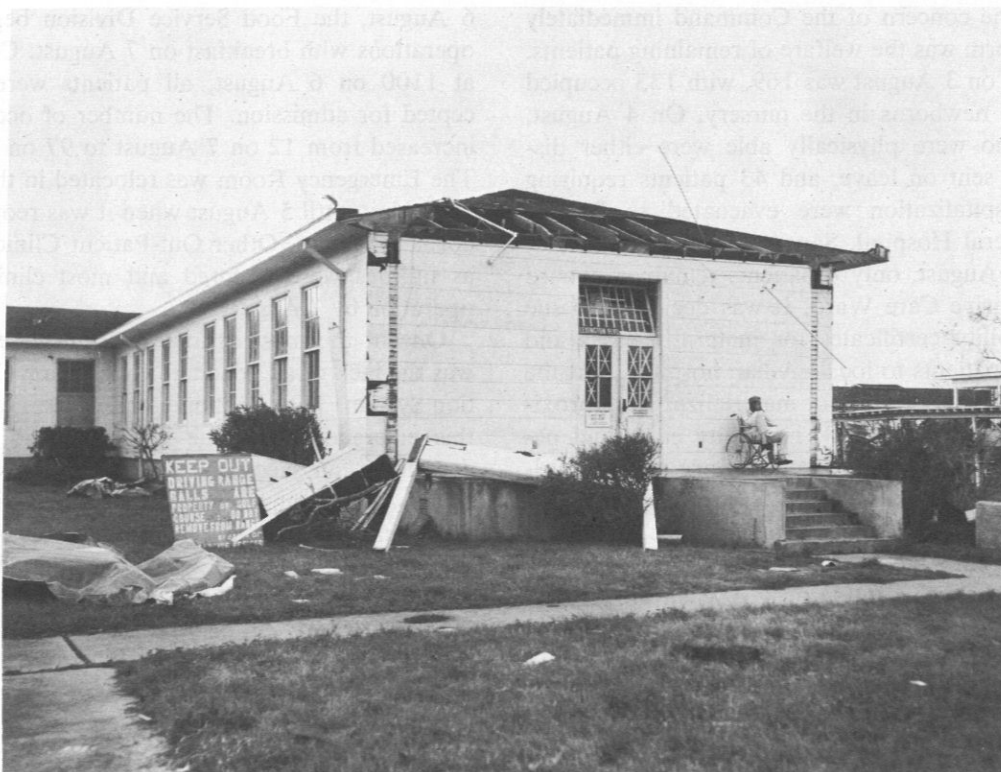
The prime concern of the Command immediately after the storm was the welfare of remaining patients. The census on 3 August was 169, with 133 occupied beds and 8 newborns in the nursery. On 4 August, patients who were physically able were either discharged or sent on leave, and 43 patients requiring further hospitalization were evacuated to Brooke Army General Hospital, San Antonio, Texas. As of 2400 on 4 August, only 4 patients remained aboard in the Intensive Care Ward. It was decided to issue non-availability certificates for maternity cases and refer these patients to local civilian hospitals, but the need for such action did not materialize. At approximately 1700 on 5 August, maternity cases and pediatric emergencies were accepted once more for admission. Though food service facilities were inoperative, inpatients were fed sandwiches, juice, milk, and fresh fruit. With the arrival of generators (courtesy of the Army and Sea Bees) on 4 August, the restoration of the Power Plant on 5 August, and gas on

6 August, the Food Service Division began normal operations with breakfast on 7 August. Commencing at 1100 on 6 August, all patients were again accepted for admission. The number of occupied beds increased from 12 on 7 August to 97 on 24 August. The Emergency Room was relocated in the Intensive Care Unit until 5 August when it was reopened at its normal location. Other Out-Patient Clinics reopened as utilities were restored and most clinics were in operation by 7 August.

One of the most serious deficiencies encountered was the lack of an adequate Emergency Communication System. The telephone system soon failed during this emergency, and the hospital radio equipment, dependent on electrical power, was also rendered useless. A communication van and radio-equipped ambulance, borrowed from the Naval Air Station, allowed the hospital to establish communication with essential Naval Air Station units immediately following Celia. There can be no doubt that all Navy medi-



Fire Door, OR Passageway



Entrance to Surg I, H-4



Triage Center, Bldg. H-6

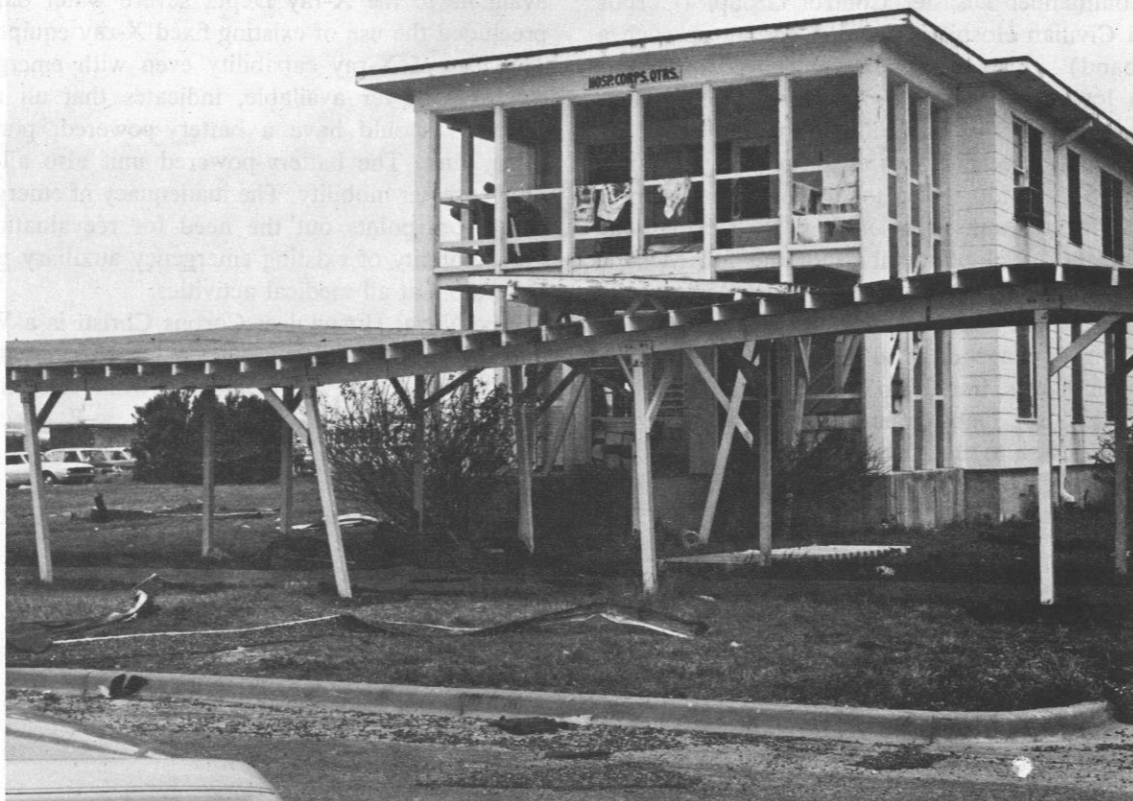
cal facilities should be equipped with battery-powered, strategically located emergency communication equipment in communication with civilian hospitals and Commander Disaster Control Group. (Corpus Christi Civilian Hospitals are now setting up such a radio band).

The loss of electrical power and potable water supply curtailed the operational capabilities of the hospital. The electrical power supplied by existing emergency generators was totally inadequate (three of the four fixed units went out with the storm). The unexpected arrival of members of the 5th Medical Depot from Fort Sam Houston late on 4 August with portable electrical generators was instrumental in preventing spoilage of food and other perishables. These generators, in addition to generators provided by the Sea Bee Detachment, were also utilized in restoring power to the Operating Room, OB-GYN, Pediatrics, Laboratory, Laundry, Supply, Refrigerator and Food Services. A battery-operated 100 MA

X-ray machine was borrowed from the Texas X-ray Corporation. This was necessitated by the fact that even though limited emergency electrical power was available to the X-ray Dept., severe water damage precluded the use of existing fixed X-ray equipment. The loss of X-ray capability even with emergency electrical power available, indicates that all naval hospitals should have a battery-powered, portable X-ray unit. The battery-powered unit also allowed *much* greater mobility. The inadequacy of emergency generators points out the need for reevaluation of the capability of existing emergency auxiliary power generators at all medical activities.

The Naval Hospital at Corpus Christi is a World War II wooden structured, widespread treatment facility that could not withstand wind velocities of 160-miles per hour, in spite of a well conceived and executed Disaster Plan. Were it not for the outstanding performance of the military and civilian staff members, during and immediately following





Celia, the extent of water and debris damage would have been much greater. Considering the extensive personal hardship experienced by many of the staff members, their performance and dedication to duty during this most trying period is highly commended.

Three weeks post Celia, the Naval Hospital at Corpus Christi was functioning to meet the needs

of the community which it serves. Though some services were not fully operational, a semblance of normalcy had returned to the daily routine of the activity. Mountains of debris were removed, temporary roof repairs were made to essential structures and utilities have been fully restored. ☸

SG MESSAGE AUG 70 TO CO NAVHOSP CORPUS CHRISTI TEXAS

"1. The responses of you and your staff to ravages of hurricane Celia have been magnificent. Your actions have protected your patients from harm and have assured them of continuing care. The solutions to countless problems have been superbly conceived and implemented.

2. You have amply demonstrated that we can properly respond to varying and difficult situations in spite of severe personal hardships which many of you have experienced.

3. I extend my congratulations and the traditional Navy "Well Done." G. M. DAVIS, Vice Admiral, U.S. Navy, Surgeon General." ☸



To the Editor: In a recent issue of the "Newsletter" I was listed as having met the requirements for certification as a Diplomate in the American Board of Anesthesiology.

This is true.

However, it appeared that I was on active duty whereas I am retired and obtained my certification after I retired.

So as not to mislead those who may read the Newsletter, could you in the next listings of Specialty Boards indicate that I am retired. Thank you.

CAPT Richard L. Fruin, MC, USN (Ret)
90 Jordan Avenue
San Francisco, Calif. 94118

Ordinarily names of retired officers are not included among the American Board Certifications listed in this publication. CAPT Fruin's name had been inserted at his request, because it had been erroneously assumed that his retirement had followed Board certification while on active duty.

To the Editor: The August Newsletter covered the closing of the NSA Hospital in DaNang. Having been a part of the team that got it started, '65-'66, I am interested in its life and history. Do you have any photos available that show the growth and development up to the time of its inactivation that I might obtain? I have the first year well documented, but have obtained little since. Thanks for any help you can offer.

Incidentally, U.S. Navy Medicine shows tremendous improvement. A good many of my Army confreres who normally are quite critical of the Navy are, in this case, envious and wish they had something similar.

CAPT Bruce L. Canaga, Jr., MC, USN (Ret)
Office of the Medical Director
Portsmouth General Hospital
Portsmouth, Va. 23704

We can think of nobody who is more entitled to photographs of the late NSA Hospital in DaNang than CAPT Canaga himself, who literally got that department started off with a bang! It is hoped that those of our readers who can, will join us in providing Dr. Canaga with whatever pictures can be found.

Incidentally, we searched among the depleted Newsletter files for an appropriate picture of CAPT Canaga at DaNang in 1966. Can anyone help? It is rather typical of the man, who modestly did so much for so many, that he successfully eluded the cameras there. 🍀

ASYMPTOMATIC GONORRHEA

Richard W. Thatcher, MD; LCDR Ward T. McCraney, MC, USN; Douglas S. Kellogg, Jr., Ph.D.; and LT William H. Whaley, MC, USNR, JAMA
210(2): 315-317, October 13, 1969.

Asymptomatic gonorrhea in females and males does exist, and its incidence depends on the group studied. Those groups with the greatest chance of exposure to gonorrhea have the highest percentage of asymptomatic gonorrhea. In a routine physical examination of 505 military personnel, who all were asymptomatic for gonorrheal infections, cultures of the urethra, rectum, and pharynx were obtained to determine the presence of gonococcus and meningococcus. Neither *Neisseria gonorrhoeae* nor *N meningitidis* was recovered from the urethral or rectal cultures. Seventy-four male patients (14.6%) had the meningococcus recovered from the pharynx, and one had the gonococcus recovered from the pharynx.

There has been a steady increase in the incidence of gonorrhea in the United States for the past six years. Last year 431,280 cases were reported; however, it is estimated that the true figure is over 1,500,000.

Any effort to control gonorrhea must take into account the presence of asymptomatic disease. The stimulus that prompts a person to seek medical care would be absent in infected patients without symptoms, and their disease may be spread to others unknowingly.

There have been several studies reporting on asymptomatic gonorrhea in both women and men. They show that it does exist, and the incidence differs depending on the group studied.

Pariser and Farmer examined 211 asymptomatic women who had recent sexual contacts with men known to have gonorrhea and found that 76 or 36% had *Neisseria gonorrhoeae* recovered from the cervical os. (Table 1). In another study the same authors found that out of 115 men who had recent sexual contacts with women with known cases of gonorrhea,

98 had no symptoms of the disease; of these, 26 or 26% had *N gonorrhoeae* recovered from the urine sediment or prostatic secretions. Harris and associates examined 213 consecutive incoming female prisoners who had no symptoms of gonorrhea; of these 44 or 21% had the gonococcus recovered from the cervical os, urethra, or vagina. Carpenter and Westphal examined 1,061 consecutive incoming male prisoners and found all to have no symptoms of gonorrhea; of this group, 11 or 10% had the gonococcus recovered from the urine sediment or prostatic secretions. Pariser and Farmer found in 86 male volunteers to a venereal disease clinic that 22 had no symptoms of gonorrhea and, of these, 3 (14%) had the gonococcus recovered from the urine sediment or prostatic secretions.

In a group of 1,309 female patients with no symptoms of gonorrhea attending an obstetric clinic, Kraus and Yen found 75 or 6% of them to have the gonococcus recovered from the cervix and cervical canal.

In the present study 505 consecutive male patients from a military population having a routine physical examination who had no signs or symptoms of gonorrhea, underwent culture for the gonococcus and the meningococcus from the urethra, rectum, and the pharynx.

Methods

Male patients who were undergoing physical examination at the Atlanta, Georgia Naval Air Station who had no signs or symptoms (dysuria and urethral discharge) of gonorrheal infection were candidates for the study.

A pharyngeal, rectal, and urethral culture were obtained from each person. The pharyngeal cultures were taken with a cotton swab, culturing per os as high as possible into the nasopharynx. Rectal cultures were obtained with a cotton swab. The urethral cultures were obtained with a 2-mm platinum loop which was inserted into the urethra at a distance of at least 4 cm and withdrawn along the mucosa.

From the Venereal Disease Branch (Dr. Thatcher) and the Venereal Disease Research Laboratory (Dr. Kellogg), National Communicable Disease Center, and the Naval Air Station (LCDR McCraney and LT Whaley), Atlanta. Dr. Thatcher is now with the Jules Stein Eye Institute at the UCLA School of Medicine, Los Angeles.

Reprint requests to UCLA School of Medicine, Los Angeles 90024 (Dr. Thatcher).

TABLE 1.—Groups Examined for Asymptomatic Gonorrhea

Groups Examined	Total	No. of Patients Asymptomatic	No. of Patients Asymptomatic With Gonorrhea %	Percentage of Patients Asymptomatic With Gonorrhea	Specimens Used	Techniques of Isolation of <i>Neisseria gonorrhoeae</i>
Female sex partners of known gonorrhea patients	211	211	76	36	Cervical os	Direct fluorescent antibody stain of smear, gram stain of smear, culture
Male sex partners of known gonorrhea patients	115	98	26	26	Urine sediment, prostate secretions	Direct fluorescent antibody stain of smear, gram stain of smear, culture
Female prisoners, new admissions	213	213	44	21	Cervical os urethra, vagina	Culture
Male volunteers to venereal disease clinic	86	22	3	14	Urine sediment, prostate secretions	Delayed fluorescent antibody stain of smear
Females attending obstetric clinic	1,309	1,309	75	6	Cervix and cervical canal	Culture
Male prisoners, new admissions	1,061	1,061	11	1	Urine sediment, prostate secretions	Culture
Males in military population	505	505	1*	0.2	Urethral scraping, rectum, pharynx	Culture

*Gonococcus was isolated from pharynx only.

Each specimen was immediately streaked onto Thayer-Martin selective medium and placed in a candle jar for a 2% to 3% CO₂ atmosphere. The plates were incubated for 24 hours at 37° C and examined.

Identification of *N gonorrhoeae* was made by growth of typical colonies of gram-negative diplococci on Thayer-Martin medium that gave a positive oxidase reaction. Sugar fermentation of glucose and staining of the organisms with direct immunofluorescent antigonococcal conjugate was confirmatory.

Identification of *N meningitidis* was made by growth of typical colonies of gram-negative diplococci on Thayer-Martin medium that gave a positive oxidase reaction that also fermented glucose and maltose. Each isolate was further typed as to its specific group by the Bacterial Reference and Serology Units of the National Communicable Disease Center by slide agglutination.

Results

Out of a total of 505 male patients from whom cultures were obtained, 234 were personnel who were undergoing physical examination for discharge; the other 271 were receiving a routine physical examination. The average age of the patients was 20 years.

Of the 505 males, 49 (9.8%) admitted having had gonorrhea in the past, at an average of four months previously. All said they had received medical treatment. An additional 19 or 2.8% said they had non-specific urethritis in the past at an average of six months previously, and all said they had received medical treatment. Fourteen of the 49 patients in the gonorrhea group said they had had the disease more than one time. Four of the nonspecific urethritis group said they had had the disease more than one time.

None of the urethral and rectal cultures grew *N gonorrhoeae* or *N meningitidis*. One of the pharyngeal cultures grew *N gonorrhoeae*, and 74 grew *N meningitidis* (Table 2). The meningococcal carrier rate for the group was 14.6%. The specific types of *N meningitidis* are outlined in Table 3.

Comment

Asymptomatic gonorrhea in female and male patients does exist and its incidence depends upon the group studied. What asymptomatic means differs depending on whether it is defined by the physician or the patient. The patient, especially the female, may not notice or pays little heed to symptoms obvious to a physician to be consistent with gonorrhea. In the studies cited and in our own study, the physician's

TABLE 2.—Number of Positive Cultures From 505 Asymptomatic Males

Organism	Pharynx	Urethra	Rectum
<i>Neisseria gonorrhoeae</i>	1	0	0
<i>N meningitidis</i>	74	0	0

TABLE 3.—Specific Groups of *Neisseria Meningitidis* Isolated From Pharyngeal Culture of 505 Men Asymptomatic for Gonorrhea

Group	Number of Isolates
B	16
C	12
X	3
Y	8
Z	2
Rough	12
Crossed	7
Lactimicus	12
Ungrouped	2

definition of being without symptoms was used. However, from a public health point of view, what the patient deems as symptoms of gonorrhea is more important. Even though he may be symptomatic according to a physician, he may consider himself to have no symptoms of gonorrhea and is not stimulated to seek medical care. Using the patient's own definition of being symptomatic would, no doubt, increase the percentage of asymptomatic patients with recoverable gonococci in the studies cited.

In general, the groups that have the highest risk of exposure to gonorrhea have the highest amount of asymptomatic gonorrhea. Female and male sexual contacts of known cases of gonorrhea have the highest incidence, followed by incoming female prisoners and male volunteers to a venereal disease clinic. General populations of females attending an obstetric clinic and males from a military population have the lowest incidence in the studies cited (Table 1). Females have more asymptomatic gonorrhea than do males when similar groups are compared (Table 4).

TABLE 4.—Comparison of Similar Groups Examined for Asymptomatic Gonorrhea

Groups Examined	Percentage of Asymptomatic Patients With Gonorrhea
Female sex partners of known gonorrhea patients	36
Male sex partners of known gonorrhea patients	26
Female prisoners, new admissions	21
Male prisoners, new admissions	1

In some of those patients without symptoms who have the gonococcus recovered, the disease could possibly be in a period of incubation. However, gonorrhea has a relatively short incubation period of 2 to 4 days. Those persons in whom the disease is in a period of incubation have no indication they are carrying the pathogen and may spread it to others unknowingly.

The specimens taken and the techniques used to identify the gonococcus differ somewhat from investigator to investigator. However, the positive results obtained from these studies may be looked upon as being fairly accurate and err in not being sensitive enough. Some positive asymptomatic cases would, therefore, go undetected.

In our study the one case of the gonococcus being isolated from the pharynx is of interest. Three previous cases have been reported by Fiumara, and each patient had pharyngitis. The patient in this study had no sign or symptoms of pharyngitis.

The meningococcal carrier rate of 14.6% is not unusual for a military population and serves as a control for the study.

(The references may be seen in the original article.)

On 20 March 1970, the Navy Preventive Medicine Unit Number SIX was presented an "Award of Honor" by the Federal Safety Council of Hawaii for outstanding support in council activities.

MAXILLOFACIAL INJURIES*

General Considerations:

Early débridement and primary closure of facial soft tissue injuries and reduction of facial fractures greatly alleviates postoperative complications, shortens the patient's convalescent time and reduces the number of secondary surgical procedures.

After controlling hemorrhage and correcting airway embarrassment, maxillofacial injuries are not life endangering and more serious casualties should take precedence. Early soft tissue treatment is necessary but can be delayed up to 72 hours with acceptable results.

Maxillofacial Injuries

1. Airway embarrassment:

A. Following injury to the mandible, tongue and soft tissues lose their bony support and will frequently fall into the posterior pharynx if the patient is placed on his back.

B. If the patient is placed on his side or face down this problem is corrected and the necessity for emergency tracheostomies in the field is reduced. Nasopharyngeal airways may be used at this time to maintain a patent airway.

C. Further evaluation of the patient is accomplished at a more sophisticated hospital to determine the necessity for a tracheostomy. At this installation the tracheostomy would be accomplished under more ideal circumstances.

D. With the patient placed in the lateral or prone position the potential for aspiration is reduced. These patients are usually intubated awake so there should be less blood in the stomach thereby reducing the possibility of aspiration or emesis.

2. Hemorrhage may be significant due to the complex blood supply of the head and neck.

A. Hemorrhage should be controlled by ligation of the individual vessels, reduction and fixation of the fractures, nasal and maxillary sinus packing and by soft tissue closures.

B. There may be generalized ooze from traumatized muscle; adequate soft tissue closures with pres-

sure dressings usually aid in controlling ooze type hemorrhage.

3. Antibiotics:

The treatment of grossly contaminated maxillofacial wounds requires high doses of one antibiotic keeping in mind that the oral flora is usually mixed with mainly gram-positive organisms. High doses of ampicillin or penicillin alone have been effective.

4. Diet:

A. Intravenous, nasogastric and/or esophageal tube feedings are necessary until oral wounds have closed (3-10 days).

B. Dental liquid or soft diet should be used whenever tolerated by the patient.

C. Diet supplements could be used at the discretion of the surgeon.

5. Evacuation:

A. Patients should receive N.P.O. morning of flight.

B. Patients should be given an antiemetic by either the intramuscular or suppository route.

C. All patients that are in intermaxillary fixation should have scissors with them at all times. These should be carried about their necks with umbilical tape. Scissors should serve to cut wires as well as elastics.

D. Patients should be instructed in procedures to cut the intermaxillary elastic and/or wires. They should be instructed to notify flight personnel immediately if they experience nausea or motion sickness.

E. Non-responsive patients or patients that are physically unable to cut wires should be watched closely by flight personnel.

F. Tracheostomy tube with cannula should be left in place. Rush tubes should not be used as tracheostomy tubes in evacuated patients.

Care of Specific Areas

1. Soft tissue wounds:

A. Wounds are prepped by thorough washing with antibacterial solution (Betadine/pHisoHex) and are irrigated with copious amounts of sterile solution.

* Taken from proceedings of CINCPAC Fourth Conference on War Surgery, February 1970.

B. Maxillofacial wounds are debrided conservatively and closed primarily in contrast to other war wounds where wider débridement is performed and wounds left open.

C. Small Penrose drains are desirable in facial wounds involving the neck and angle of the mandible to prevent possible hematoma formation and fluid accumulation in dead spaces.

D. Small stellate and irregular soft tissue wounds are excised and closed primarily.

E. Large stellate wounds are debrided and closed in the easiest manner, realizing that reconstructive surgery will be required later.

F. Massive stellate soft tissue defects are debrided and skin sutured to mucosa to maintain continuity of the injured areas.

G. Rotation or transposition flaps should not be utilized to provide coverage of underlying bone, nerves and/or sinuses. STSG grafts may be used to aid in the closure of large, avulsed type soft tissue wounds.

H. Traumatically tattooed wounds are meticulously debrided with scrub brush or scalpel; often hundreds of small fragments of discolored material remain deep in the tissue.

I. In trauma of the external ear, minimal débridement and skin closure will usually yield good results since tension is slight and blood supply excellent. All cartilage should be cleaned well and covered with skin to prevent chondritis. Partially avulsed portions of the ear, if a pedicle remains, should be reapproximated and sutured. Supporting cotton and compressive sterile gauze dressings should be used to avoid hematomas.

J. Facial nerve lacerations should be reapproximated at the time of initial exploration. If the defect is too large to permit a primary anastomosis, the nerve ends should be tagged with monofilament suture through the epineurium for future identification. Any wound over the course of the facial nerve from the stylomastoid foramen to the peripheral branches resulting in a partial or total paralysis should be explored. Intratemporal trauma to the Facial nerve should be treated as soon as the neurological status permits.

K. Injured submaxillary and sublingual glands may be removed. Injured parotid glands present a much more complicated problem and attempted removal of the injured gland at the time of injury is a time consuming exercise that is probably not justified. Portions of the gland will be removed due to injury and in exploration of the Facial nerve. Good

pressure dressing should be used to compress the dead spaces and possibly prevent a salivary fistula.

L. Lacerated parotid ducts should be reapproximated if possible. This usually is very difficult; it usually is more advantageous to place a polyethylene tube into the proximal duct and suture this to the mucosa of the oral cavity. This will promote epithelization down the cannula into the oral cavity thereby creating a new orifice.

2. Mandible:

A. The usual war wound of the mandible is one of gross comminution and/or avulsion.

B. Treatment as to reduction, would depend on many factors, however, the following steps should be accomplished in *ALL CASES*.

(1) Copious irrigation of the open wound.

(2) Removal of tooth fragments, foreign bodies, and *ONLY* that bone that is flushed to the surface with the saline or loosened by the rinse.

(a) All bone that is attached to periosteum and/or soft tissue and that has a blood supply should be retained. This bone may act as a nidus of ossification in bone repair.

(b) Large segments of bone that may not be attached to soft tissue may be reduced with minimum transosseous wires to maintain the continuity of the mandible. Wires should be kept to a minimum since more periosteum is elevated to facilitate their placement with possible jeopardization of vital bone. Wires to stabilize many small fragments only add more foreign material and the possibility of infection.

(3) All bones should be covered by skin or mucosa.

(4) The wound should be closed in layers beginning with mucosa and ending with skin.

C. Reduction of mandible:

(1) The simplest fixation is the best possible treatment. This includes Ivy loops, multiple loop wiring, circumferential wiring, risdon, essig or other conventional intermaxillary wiring.

(2) In avulsion and/or comminuted mandibles more use of mandibular and palatal splints is advocated. After copious irrigation, débridement and closure, impressions should be made for the construction of splints. Splints may be placed as soon as manipulation of traumatized tissue allows without further breakdown—approximately 7–10 days.

(3) When intermaxillary wire over elastics for stabilization is deemed the treatment of choice, tracheostomy should be strongly considered to pre-

vent the complication of aspiration. However, if only a single wire is used in the midline for fixation and this is readily accessible for rapid removal, the indications for tracheostomy are lessened.

(4) When full dentures or Gunning-type splints are used for fixation, they should be designed in such a manner that there is a large space in the anterior region to facilitate suction of secretions. The anterior teeth of the maxillary and mandibular dentures should be removed to facilitate suctioning of the oral cavity.

3. Mid-face Trauma:

A. Mid-face fractures, with or without mandibular fractures, are treated conventionally—with suspension from the zygomatic arch, lateral orbit or other stable areas of the cranium.

B. Splints are invaluable in the reduction of palatal and alveolar fractures. Utilization of maxillary splints is also necessary for through and through wounds of the palate where there is a loss of hard and soft structures. With the aid of the palatal splint the nasal cavity may be packed against the undersurface of the splint aiding in hemostasis and bony support.

C. Adequate fixation of mid-face fractures is frequently necessary to stem cerebrospinal fluid rhinorrhea.

D. Nose wounds are debrided, closed and packed to support nasal bones and to control hemorrhage. Through and through 28–30 wire sutures through nasal bones and skin, fastened through buttons or splints, may be needed to support a crushed nasal skeleton.

E. Maxillary-zygomatic complex and sinus wounds are debrided through the wound or through a Caldwell-Luc approach. A nasoastral pack may be placed for hemostasis and to support the orbital floor and rim. Silastic implant or other alloplastic material is utilized to reconstruct a grossly comminuted orbital floor and prevent herniation of the orbital contents into the maxillary sinus. This should be accomplished through an infraorbital incision.

F. Frontal sinus wounds may include a craniotomy. If the anterior table is not reparable then removal of all mucosa, plugging of the nasofrontal duct and sinus obliteration should be done. If the duct mucosa appears normal, then the duct should not be touched with the hope of creating better drainage in a fractured sinus.

4. Some Factors of Importance in Neck Wounds:

A. Significant vessel injury must be suspected even with small wounds. All wounds of the neck should be explored.

B. Various cranial nerves (IX, X, XI, XII) may be injured with missile wounds at the base of the skull but primary exploration and attempted repair is rarely indicated. Facial nerve is an exception.

C. X-rays of the neck should be made to search for air in tissue planes.

Air in tissue planes, especially in the postpharyngeal area, usually means perforation of air or food passages (although some air may be drawn into the planes when tracheostomy is performed or with the missile).

D. The signs and symptoms of laryngeal injury include:

1. Swelling.
2. Airway obstruction with stridor, retraction and cyanosis.
3. Hoarse voice or aphonia.
4. Drooling (adjacent esophageal swelling).
5. Crepitation in neck tissues.
6. Visible or palpable open injury to larynx.

E. In missile wounds of the larynx a tracheostomy is frequently necessary. Laryngoscopy followed by open repair and possible placement of intralaryngeal splint may be necessary to prevent stenosis of the larynx. Repair should be carried out by someone experienced in laryngeal surgery, as soon after injury as feasible. Cervical tracheal wounds may be closed primarily, using tracheal or local muscle or fascia, and using drainage as in other neck wounds. Most neck wounds can be closed primarily, with drainage, after adequate débridement.

F. Wounds of the air and food passages in the cervical region should be investigated first by esophagoscopy. They should then be surgically explored, a layered closure carried out, the wound drained and the skin closed primarily. Nasogastric tube feedings for 7–10 days will be necessary in pharyngo-esophageal injuries, until the wound is watertight (depending upon the size of the wound). Antibiotic coverage is mandatory.

G. Small wounds of the lower pharynx and cervical esophagus may be hard to identify upon exploration of the neck. Drains at the probable area of injury, nasogastric tube feeding for 7 days and adequate antibiotic coverage will usually allow the wounds to heal without incident. ☘

A METHOD FOR PREPARING PERMANENT WHOLE MOUNTS OF PARASITIZED SNAILS, REVEALING THE INTERNAL ANATOMY AND TREMATODE LARVAL FORMS

R. Grace Hsu*, G. W. Hooper Foundation, University of California Medical Center, San Francisco, California 94122 J Parasit 55(5): 1093, October 1969.

Molluscs, fixed, stained, and cleared by a simple procedure described here, show details of host structure (Fig 1, not shown) and internal parasites (Fig 2, not shown) with little loss of clarity after more than 5 years. The method combines well-known techniques in a manner that has proved particularly suitable for simple handling of mass-produced material for teaching or research.

Live snails in a Stender dish half filled with pond water were relaxed 20 to 40 minutes, depending on the species, by gradual addition of a mixture of equal volumes of 1% Nembutal®, 10% dimethyl sulfoxide, and pond water. The snails were then fixed in a solution of 1 part 10% dimethyl sulfoxide and 4 parts AFA for 30 min after which the fixative was poured off and the specimens stored in AFA until further processing.

The shell was decalcified, leaving the transparent periostracum intact to maintain the snail in its natural form through subsequent processing. For that purpose, chlorinated alcohol was made by adding 1.5 ml of 37% HCl to 1 g potassium chlorate in a Stender dish which was immediately covered. When chlorine gas appeared, 100 mls of 70% ethyl alcohol

were added. Fixed snails were placed in the container and tightly covered until their shells were decalcified and their dark pigments bleached (72 or more hr.). The snails were then hydrated and washed in water for 2 to 6 hr.

After staining in Gower's carmine at 37°C for 15 to 30 min, specimens were dehydrated through an alcohol series to 70% ethyl alcohol differentiated in 0.5% acidified alcohol, and then dehydrated to 95% ethyl alcohol. Counterstaining with fast green was followed by gradual dehydration and clearing from 95% ethyl alcohol through warm terpeneol to balsam. The snails were mounted in heated, thick balsam.

This work was initiated at the U.S. Naval Medical Research Unit II in Taipei, Taiwan, through the courtesy of Dr. Robert A. Phillips, Captain, MC, USN, former Director of the Unit, and Dr. Robert Kuntz, former head of Parasitology Department. The author thanks Dr. Donald Heyneman of the G. W. Hooper Foundation for the opportunity to continue this study. This investigation was supported in part by the Asia Foundation of the United States.

(Figures 1 & 2 may be seen in the original article.)

* Author now deceased.

OPTOMETRY STUDENT PROGRAM—Candidates for Doctor of Optometry degrees may now be selected for commissions as Ensigns, MSC, USNR (with full pay and allowances) in their final year of school. This new senior student program is expected to provide a continuous input of adequate numbers of optometrists for active duty in the Medical Service Corps. Obligated service of 3 years, following graduation, is a requirement of those who participate. ☸



NAMES AND FACES IN THE NEWS

PO1 Ernest Click administered first aid to an accidental gunshot victim at a social gathering on the James River in Springfield, Mo. on Sunday, August 16th. According to a member of the local Rescue Squad, Petty Officer Click's able assistance was instrumental in saving the victim's life. This fine gesture was praised in a letter addressed to CDR H. R. Pedneault, CO, Springfield Naval and Marine Corps Reserve Training Center.

CDR Robert C. McMurdock, Jr., DC, USN and **CDR Wayne J. Toth, DC, USN**, were awarded first prize for their table clinic on "Plaque Control Procedures" presented at the Miami Beach meeting of the National Dental Association in early August. The officers are attending advanced programs in periodontics, CDR McMurdock at the Naval Dental School and CDR Toth at the Georgetown University School of Dentistry.

CAPT Lewis L. Haynes, MC, USN, Retired, was named Chairman, Service to Military Families for the Greater Boston Red Cross, a key volunteer position. On the Red Cross Board of Directors since 1967, CAPT Haynes was CO, Chelsea Naval Hospital in Boston, Mass., 1964-65. He retired from the Navy in 1965 after more than 27 years of active service. His son, LCDR Haynes is currently Senior Surgical Resident at Nav Hosp Boston, Chelsea, Mass. In his new position with Red Cross, CAPT Haynes will be responsible for a department which provided 21,420 services to military men and their families last year.



CAPT C. F. Johnson, MSC, USN

CAPT Calvin F. Johnson, MSC, USN, Medical Administrator for the Twelfth Naval District on Treasure Island in San Francisco Bay, celebrated his 40th year of continuous naval service on 7 Oct. He enlisted in the US Navy as an Apprentice Seaman in 1930 and was commissioned an Ensign in 1943.



GEN L. W. Walt, Assistant Commandant of the Marine Corps, presents the letter of appreciation to CAPT Hirst.

CAPT John M. Hirst, MSC, USN, who served as the Entomology Consultant to the Commandant of the Marine Corps from October 1960 until his retirement on 1 October 1970, was cited by a letter of appreciation. On behalf of the Commandant, General L. W. Walt, Assistant Commandant of the Marine Corps, presented the letter of appreciation to CAPT HIRST, a recognized authority in all aspects of pest and rodent control. Praising his accomplishments in the field of Preventive Medical Support for the Marine Corps, the letter reminded CAPT Hirst: "As a career professional you are already aware of the impact of your accomplishments on Marine Corps planning and policy."

CAPT Robert E. Mitchell, MC, USN, was notified by the North Atlantic Treaty Organization's Advisory Group for Aerospace Research and Development that his proposed paper has been accepted by the Technical Program Committee for presentation on Sept. 21 in Germany.

Authors of the paper are Dr. Mitchell, Dr. Ashton Graybiel, Dr. Albert Oberman and Dr. W. R. Harlan. Doctor Mitchell is head of the Medical Sciences

Department of the Naval Aerospace Medical Research Laboratory at Pensacola, Florida.

The paper, entitled "The Thousand Aviators—A Thirty-Year Follow-Up," will be read in Convention Hall, Garmisch-Partenkirchen, Germany, at the Aerospace Medical Panel Specialists Meeting on "Physical Fitness in Flying, Including the Ageing and Aged Aircrew."

The time frame will permit reporting only on electrocardiographic and blood pressure findings of the Laboratory's Thousand Aviator Study.

In 1940-41 Dr. Ashton Graybiel participated in the examination of 1,056 flight students and instructors in an attempt to identify and validate tests which would have predictive value in terms of success or failure of the candidates in the Navy flight training program.

Initial studies consisted of many psychological and physiological tests. Some of the psychological and psychomotor test results had predictive value and their subsequent application led to a savings of many millions of dollars for the Navy.

The predictive value of the physiological test items, in terms of success in training, were almost forgotten in the stresses of World War II. But after the war the value of a study of the aging processes was recognized by Dr. Graybiel, and although the project was not originally designed as a longitudinal study, reexaminations in 1952, 1958, 1963 and 1969 emphasized its value in studying aging processes as well as in defining new physical standards for aviators.

The paper will be presented by CAPT Mitchell as a progress report after studying the participants' records maintained over a period of 30 years at the Pensacola medical activity. CAPT Mitchell will present technical information on patterns found in electrocardiograms, and data on blood pressures. The authors of the paper believe some stringent physical standards can be modified with resulting benefit to the individual and the Navy, with significant conservation of government funds.

The fifth evaluation of the 780 survivors of the original 1,056 volunteers commenced in 1969 and will continue through the early part of 1971.—PAO, U.S. Naval Aerospace Medical Center, Pensacola, Fla.



CAPT George E. Balyeat, MC, USN, ex-Hospital Corpsman, Student Flight Surgeon, and Aerospace

Medicine Resident, will now supervise training of personnel in all these categories in his new position as Head of the Training Department at the Naval Aerospace Medical Institute in Pensacola, Fla. CAPT Balyeat's naval service was interrupted after serving as a Hospital Corpsman in World War II, by medical school and five years of private practice. In 1966 at the Univ. of California he earned the Master of Public Health degree.



RADM Felix P. Ballenger, CO, National Naval Medical Center, Bethesda, Md., was recognized as a "distinguished alumnus" at a luncheon held 23 October by the Ex-Students Association of the Texas Technological College in Lubbock, Texas. RADM Felix P. Ballenger, one of four alumni to be honored this year, graduated from Texas Tech in 1934 with a Bachelor of Arts degree. He was awarded the degree of Doctor of Medicine, in 1938, from the University of Texas Medical School in Galveston.

He began his military career in 1942 after serving a year of internship at the John Sealy Hospital, Galveston, and a three-year surgical residency at the Indiana University Medical Center in Indianapolis.

RADM Ballenger is a Fellow of the American College of Surgeons and of the American College of Chest Physicians. He is a Diplomate of the American Board of Surgery and of the Board of Thoracic Surgery. 🌿

INTERNISTS GET LATEST INFORMATION

One-hundred and seventy military and civilian doctors attended a course entitled Current Concepts in Medicine at the National Naval Medical Center, in Bethesda, Md., 17-18 September 1970.

The physicians attending the course were given overviews of the current procedures and techniques used in the fields of cardiology, renal disease, gastroenterology, chest medicine, hematology, rheumatology, endocrinology and metabolism, neurology, and allergy and immunology.

According to CAPT Lay M. Fox, Chief of Medicine of the Hospital at the Medical Center, and Course Director, the presentations by the speakers were directed at the practicing internist and were intended to provide recent information on a variety of topics.

Speakers at the course were specialists from the Naval Hospital, NNMCM; the Walter Reed Army Medical Center; Temple University School of Medicine in Philadelphia; the National Institutes of Health; the George Washington University Hospital; the Georgetown University School of Medicine in Washington, D.C.; and the Johns Hopkins School of Medicine in Baltimore.

CDR Dixon A. Lee, Head of Cardiology at the Naval Hospital, NNMCM, discussed methods for the selection of patients for surgery to restore blood flow to areas of the heart where flow has been blocked. CDR Lee announced that the Naval Hospital, NNMCM, was now beginning to perform these procedures, and is accepting referrals of appropriate patients for evaluation.

COL H. Worth Boyce, Chief of Gastroenterology at the Walter Reed Army Hospital, said that, although most amebic liver abscesses heal in a few months, occasionally it takes considerably longer. He noted that as long as these slower healing patients are doing well, there is no need to re-treat the patient. COL Boyce mentioned that Metronidazole (Flagyl[®]), a drug not yet released by the Food and Drug Administration for clinical use, has shown promise in treating amebic liver abscesses.

CDR Michael F. Fornes, a Fellow in the Gastroenterology Branch of the Naval Hospital, NNMCM, showed a movie of esophagogastric disorders. He made the movie using a fiberoptic esophagoscope and a camera with self-adjusting zoom lens. CDR Fornes said that this type of movie could be useful as a teaching aid, by graphically showing the types of pathology that may be encountered in the esophagus and stomach.

A panel discussion with CAPT William M. Lukash, Head of Gastroenterology at the Naval Hospital, NNMCM; LCDR Richard W. Virgilio, a surgical resident at the Naval Hospital, NNMCM; COL Boyce; and Dr. J. Richard Thistlethwaite, Clinical Professor of Surgery at the George Washington University Hospital, brought out that early surgery is indicated in the management of a patient suspected of having acute pancreatitis when there is any doubt about the diagnosis. Such early surgery does not lead to an increase in morbidity or in mortality. Surgery is also indicated when medical management of a patient does not result in the expected improvement.

LCDR Jack E. Zimmerman, staff member of the Cardiology/Chest Branch of the Naval Hospital, NNMCM, reported on clinical experiences during his recent tour aboard the US Navy Hospital Ship SANCTUARY, off the coast of the Republic of Vietnam. He concluded that the quantity of fluids given to patients with hypovolemic shock was critical, and should be carefully monitored. Excessive amounts of fluids appeared to be the cause of acute pulmonary edema ("Shock lung").

Dr. H. James Day, Professor of Medicine at the Temple University School of Medicine, noted that commonly used drugs (aspirin, for example) have an effect on platelet aggregation. Work is currently underway to determine whether such drugs have a place in the treatment of thromboembolic disorders.

Dr. John L. Decker, Chief of the Arthritis and Rheumatism Branch of the National Institute of Arthritis and Metabolic Diseases at NIH, reported that patients with rheumatoid arthritis showed significant improvement when treated with cyclophosphamide. His report was based on a cooperative study involving several hospitals. He commented that although the treatment shows promise, it is still in the investigative stage. Cyclophosphamide has not been released by the FDA for clinical use in rheumatoid arthritis.

CDR William L. Brannon, Jr., Chief of Neurology at the Naval Hospital, NNMCM, reported that he has found L-Dopa of great usefulness in treating muscular rigidity in patients with Parkinson's Disease. He said that the drug seemed to be less effective in the control of tremors associated with the disease.

Chief Allmond, administrative assistant to the director of the two-day course, considered that the course was very successful, drawing 61 civilian doctors, as well as 109 military physicians from all of the services.

CAPT Fox commented that because of the "great number of favorable comments" from people who attended the course, the Naval Hospital was planning to make the course an annual event.—PAO, NNMC, Bethesda, Md. ☸

GORGAS MEMORIAL INSTITUTE ANNUAL MEETING

The Gorgas Memorial Institute of Tropical and Preventive Medicine, Incorporated, held its 47th annual meeting in Washington, D.C. on 15 September 1970 at the Medical Society of the District of Columbia Building. The Institute is the nonprofit, parent organization of the Gorgas Memorial Laboratory (GML), located in the Republic of Panama. The Medical Corps of the U.S. Navy has been intimately associated with the Gorgas Memorial Institute of Tropical and Preventive Medicine from the time the institute was incorporated in 1921. RADM E. R. Stitt was a member of the original board of scientific directors. In 1928 funds became available, by an Act of Congress, for the maintenance and operation of the Gorgas Memorial Laboratory which would serve for the initial work of the institute. The Government of Panama authorized the use of a building on the grounds of the Santa Tomas Hospital, in Panama. The Laboratory has conducted biomedical research since its establishment in 1929; it is a living memorial to the work and accomplishments of Major General William Crawford Gorgas during the construction of the Panama Canal.

RADM Calvin B. Galloway, MC, USN, Retired, was re-elected President for another one-year term, together with other current officers. CAPT Lloyd F. Miller, MC, USN, Director, Research Division, BUMED, was re-elected to serve for a three-year term on the Board of Directors. The four Surgeons General (Army, Navy, Air Force and Public Health Service) serve as permanent Related Directors under provisions of the By-Laws. Prominent among Navy attendees at the meeting were: Vice Admiral G. M. Davis, Surgeon General; RADM F. T. Norris, Assistant Chief for Personnel and Professional Operations, BUMED; RADM R. E. Faucett, Assistant Chief for Research and Military Medical Specialties, BUMED; and RADM F. P. Ballenger, CO, National Naval Medical Center, Bethesda, Md. The meeting was also attended by the Honorable Maurice H.

Thatcher, author of the original Act establishing the Gorgas Memorial Laboratory, the only surviving member of the Isthmian Canal Commission, the Honorary President and General Counsel of the Institute.

CDR R. J. Kinney, MC, USN, reported on the new course in tropical and international medicine which has been developed at GML. (See Navy Medical Newsletter, May 1970, page 21).

Dr. Martin Young, Director of the Laboratory, reviewed the research activities during the past year. Among interesting items discussed was the work on Malaria. Dr. Young noted that GML scientists found more than 4 years ago, that human malaria could be grown in Panama monkeys. This provided a new model for the study of malaria; the original strain of human malaria induced in the monkeys is still being maintained four and one-half years later. A new monkey host for human malaria was identified during the past year, bringing to five the total simians in which human malaria can grow. Curiously, Dr. Young commented, foreign strains of *Plasmodium falciparum* pass well through Panama monkeys, while Panama strains of *falciparum* will not. ☸

WESTERN EEG SOCIETY MEETING

The Western Electroencephalographic Society will hold its Annual Meeting in Maui, Hawaiian Islands, 11–13 February 1971. All interested physicians and EEG technicians are invited to attend. A second call for papers is out with emphasis on clinical or clinical research papers.

For further details write Scientific Program Committee Chairmen as follows:

E. Liske, M. D.
Chief, Neurology Function
Neuropsychiatry Branch
USAF School of Aerospace Medicine (SMKN)
Brookes AFB, Texas 78235

Donald R. Bennett, M. D.
Department of Neurology
School of Medicine University of Utah
Salt Lake City, Utah 84112

Jack Mosier, M. D.
Secretary-Western EEG Society
2865 Atlantic Avenue Memorial Medical Center
Long Beach, California 90806 ☸

SPECIAL PARADE FOR PATIENTS AT MEDICAL CENTER

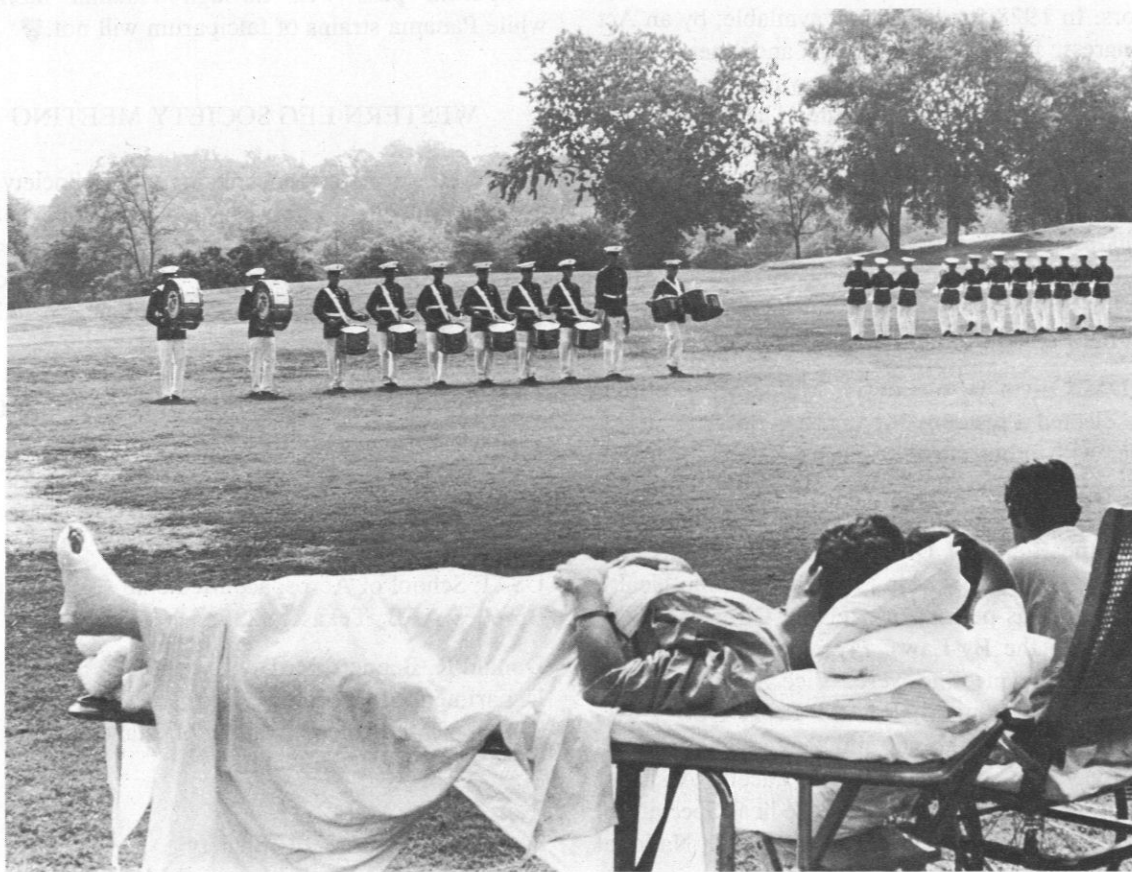
Patients and staff at the National Naval Medical Center Hospital in Bethesda, Md., were treated to a special parade by the U.S. Marine Drum and Bugle Corps and Silent Drill Team from the Marine Barracks in Washington, D.C.

A special reviewing party, including VADM George M. Davis, Surgeon General of the Navy; COL Paul G. Graham, USMC, Commanding Officer of the Marine Barracks; CAPT Miguel A. Hernandez, USMC, representative for the officer patients of the Naval Hospital; and SGT Edwin L. Powell, USMC, enlisted representative, viewed the parade. In addition, about 140 students from the St. Elizabeth School in Rockville attended the festivity as special guests of the Medical Center.

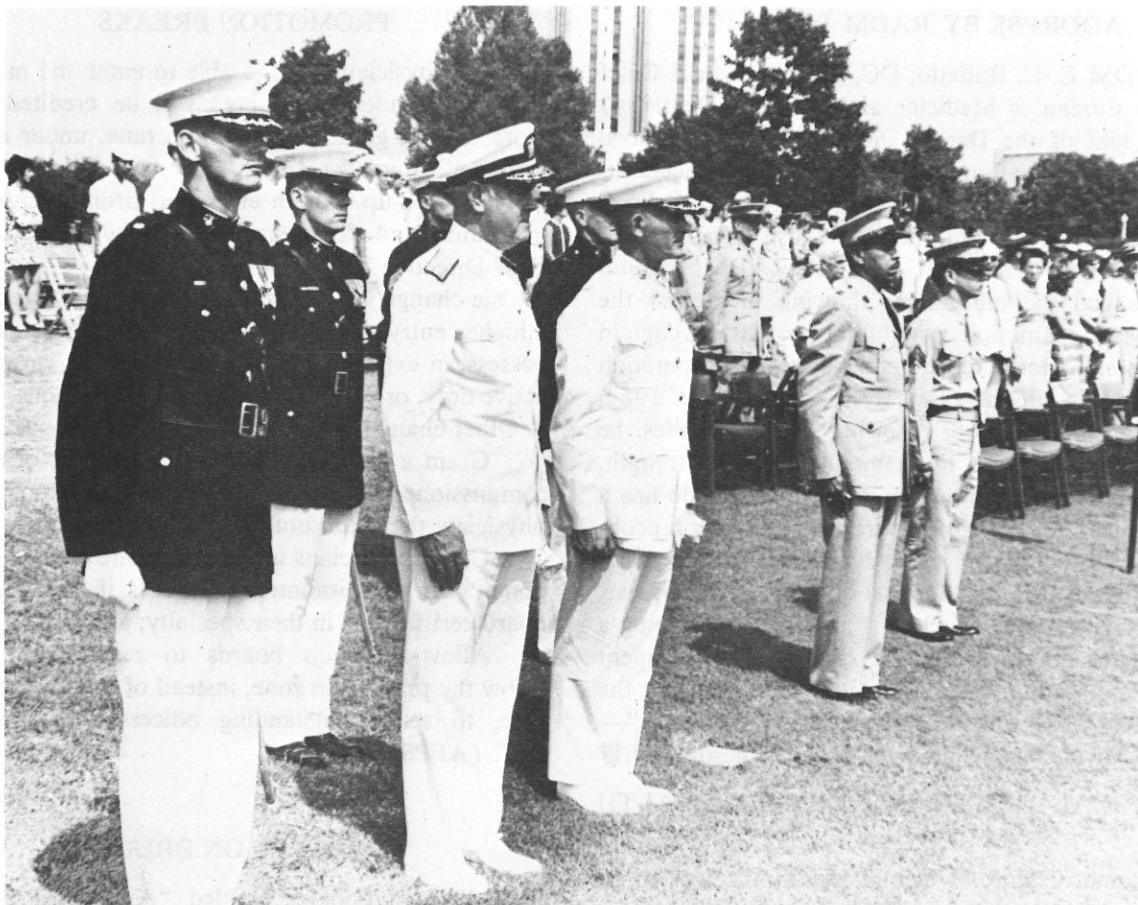
Clustered beneath trees to escape the hot sun, patients and staff watched the Silent Drill Team perform a 10-minute precision drill entirely without verbal command. This drill included a rifle "inspection" in which the inspector, standing six feet from the line of armed troops, executed a series of spins and tosses of the ten-pound M-1 rifle.

The unit, all Vietnam veterans and joint possessors of 31 personal decorations including 20 Purple Hearts, has performed on television, across the nation, overseas, and often at the White House, representing the Marine Corps in Joint Armed Forces "full honors" ceremonies.

The Drum and Bugle Corps, dressed in scarlet coats and white trousers and playing a variety of



Marine Drum and Bugle Corps.—Official U.S. Marine Corps Photo.



Reviewing party, left to right: VADM G. M. Davis, Surgeon General; COL P. G. Graham, USMC, CO Marine Barracks, Washington, D.C.; CAPT M. A. Hernandez, USMC; and SGT E. L. Powell, USMC. On the extreme left is MAJ J. W. O'Donnell, Commander of the troops.—Official U.S. Marine Corps Photo.

marches and popular music, marched with precision across the green field at the Center. Nationally famous for its intricate marching and outstanding music capabilities, the Corps is recruited from units throughout the Marine Corps and is considered the "Commandant's Own" Drum and Bugle Corps.

While the audience stood facing the color guard at

one point in the program, a speaker explained that the Marine Barracks Headquarters in Washington is entrusted with the custody of the Battle Color of the United States Marine Corps. Only this one battle standard bears all 42 streamers representing all battles, campaigns, and expeditions in which the Corps has participated.—PAO, NNMC, Bethesda, Md. ☸

Don't forget upcoming professional meetings of importance:

1. Association of Military Surgeons of the U.S., Washington, D.C., Nov. 29-Dec. 3, 1970.
2. American Medical Association (Clinical), Boston, Mass., Nov. 29-Dec. 2, 1970.
3. American Academy of Dermatology, Chicago, Ill., Dec. 5-10. ☸

ADDRESS BY RADM RAFFETTO

RADM E. C. Raffetto, DC, USN, Assistant Chief of the Bureau of Medicine and Surgery (Dentistry) and Chief of the Dental Division, spoke on Naval Dental Corps staffing problems to dental officers attending graduate courses at the Naval Dental School, NNMC, Bethesda, Md., on 28 August. In his presentation of the "Personnel Picture," RADM Raffetto encouraged the officers by showing them first the increased promotion possibilities to attain captain and commander grades. Opportunities for promotion to captain grade increased from 45% prior to 1964, to 85% at the present time, but in other grades, he noted, it is difficult to maintain required strength. For example, the lieutenant commander grade has a 147-officer deficit, caused partly by a retention problem at the lieutenant level, during the past 3 years. Recognizing this, the Admiral said, "It would appear, therefore, that our problem is not one of obtaining a satisfactory input by means of direct appointment from civilian life, but rather, it is one of selling the Navy to those who are already on active duty."—PAO, Naval Dental School, NNMC, Bethesda, Md. ☞

NATIONAL CHILDREN'S DENTAL HEALTH WEEK

National Children's Dental Health Week is to be observed 7–13 February 1971. The American Dental Association has selected this slogan for the 23rd annual event: "What Have You Done For Your Smile Lately?" During that week, the Naval Dental Corps, for the 5th consecutive year, will conduct its worldwide Preventive Dentistry Program for eligible dependent children (BUMED-INST 6600.5).

All dental facilities are encouraged to publicize National Children's Dental Health Week and to conduct a Preventive Dentistry Program for their dependent children. In the past, participation has been widespread, and a valuable service has been performed. Continued success depends on advance planning as well as on active participation by all hands. Assistance in the form of information or materials may be obtained from both the ADA and BUMED.

Program planning packets and posters for Children's Dental Health Week are available from the American Dental Association. Contact Miss Dolores Henning, Assistant Director, ADA Bureau of Dental Health Education, 211 E. Chicago Avenue, Chicago, Ill. 60611.

The Navy Preventive Dentistry Toothpaste should be requested by letter to BUMED (Code 6114) not later than 8 January 1971. ☞

PROMOTION BREAKS

Some physicians will be able to enter the military in higher grades and others will be credited with more time in grade at promotion time, under a new system effective Oct. 1.

The speed-up in both entry and promotion is tied to training and experience. The changes are part of DoD Directive 1320.7.

One change will allow up to three years' credit for a higher entry grade or promotion to physicians who possess an extra health-related degree not earned on active duty, or who have unusual qualifications.

Other changes will:

Grant a half-year credit for each year of active commissioned service performed before becoming a physician, the credit not to exceed three years;

Credit physicians in the 0–5 grade with an additional year for promotion purposes if they have a board certification in their specialty; and

Allow selection boards to reach two years below the promotion zone, instead of the present one year, to select outstanding officers.—Washington, D.C. (AFPS). ☞

BOOKLET ON DRUGS

A 29-page booklet entitled "A Federal Source Book: Answers to the Most Frequently Asked Questions About Drugs" may be obtained for twenty-five cents (\$18.75 per 100 copies) from Superintendent of Documents (Dept. D), Government Printing Office, Washington, D.C. 20402. Sections on marijuana, hallucinogens, stimulants, sedatives, narcotics and a drug glossary of common street terms are provided in laymen's language. Produced jointly by the DoD, HEW Dept., Justice Dept., Labor Dept., and Office of Economic Opportunity, this pamphlet would be useful to those charged with counseling lay groups on drug abuse. ☞

CHOLERA FILM

A 19-minute 16mm motion picture in color with sound entitled "Cholera Today, Part 2—Practical Laboratory Diagnosis—M-1478," provides essential information on the identification of the etiologic agent of cholera. Intended for a professional audience, this award-winning film may be obtained on free short-term loan from: National Medical Audiovisual Center (Annex), Station K, Atlanta, Ga. 30324. ☞

PENSACOLA SLOW ROTATION ROOM

The Pensacola Slow Rotation Room, a research device many scientists from other parts of the world travel to see at the Naval Aerospace Medical Research Laboratory, is losing its wooden superstructure to make way for a dumbbell-shaped metal replacement which will greatly enlarge the usable space, and enhance the scope of the usefulness of the centrifuge.

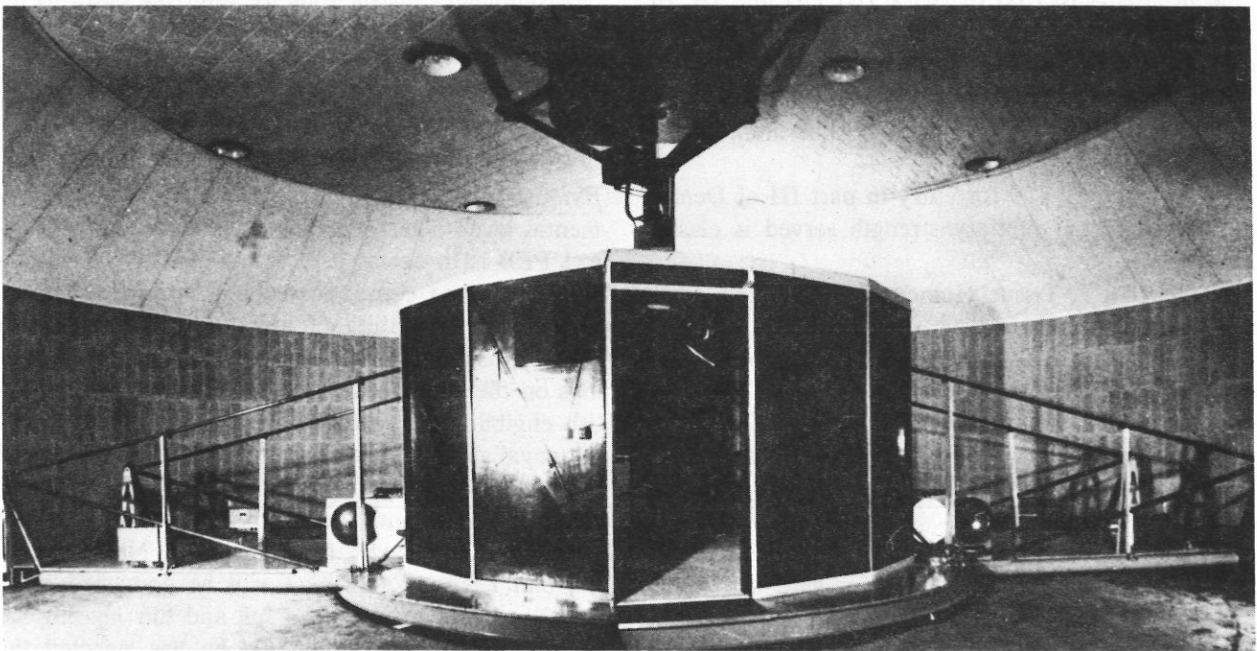
More than 100,000 runs have been made in the old room by American scientists and their colleagues from abroad. The device was built by local labor at little expense. The original flywheel used in building the research tool came from a defunct brewery in St. Louis.

A slow rotation room in a laboratory setting provides a powerful tool for the study of experimental motion sickness. In the rotating room a person is not subjected to a stressful stimulus unless he moves his head out of the plane of the room's rotation, differing from the situation in ships and aircraft where a person cannot avoid stressful accelerations generated by motions of the vehicle.

Rotating the room at 1.0 rpm causes little or no disturbance but at 10.0 rpm the reaction is comparable to exposure on rough seas. The cardinal advantages of such a room lie in its habitability, the great range permitted in strength of the disturbing stimulus, the experimenter's control over the stressful accelerations, and the opportunity presented for measurements to be made with laboratory equipment.

Three important factors contribute to habitability. First is the fact that very little more effort is required to move the head and generate the maximal stressful stimulus than is the case when the room is stationary. Second, at constant velocity there is little or no awareness that the room is rotating. The third factor is the overall advantage of allowing for adequate housekeeping facilities, food, and recreation. Some subjects have lived in such an environment for over a month, with experimenters in attendance.

Slow rotation rooms at the Laboratory are useful in attempting to predict susceptibility to side effects that result from stimulation of man's organs of balance caused by unusual accelerations. Slow rotation



The Pensacola Slow Rotation Room must make way for new uses of the centrifuge.

rooms cannot simulate space station conditions insofar as weightlessness and several other factors are concerned, however.

With the new facilities on the centrifuge, volunteer subjects will be supported by slings in a horizontal position, and suspended, so that scientists may learn more about the side effects and results of this type of stimulation of the organs of equilibrium.

The farther from the center, the greater the centrifugal force, so with the "wings" of the new facilities extending to the ends of the centrifuge, scientists will

be able to study reactions resulting from far greater stimulation of the organs of balance by these increased forces.

The Smithsonian Institution has expressed interest in the room as it previously had been. Photographs were taken before dismantling began on 16 Sept., and information is being collected about the device used in early research for aviators and astronauts subjected to unusual accelerations in aerospace situations.—PAO, Naval Aerospace Medical Center, Pensacola, Fla. 𐄂

OFFICIAL INSTRUCTIONS, NOTICES AND CHANGES

SECNAV INSTRUCTION 6300.2, 4 Sept. 1970

Promulgates guidelines for family planning services (contraception, sterilization, and abortion) at Navy medical facilities.

- Encl: (1) Request and Consent for Surgical Sterilization (NAVMED 6300/2)
(2) Statement of Need for Therapeutic Abortion (NAVMED 6300/3)
(3) Consent Form for Therapeutic Abortion (NAVMED 6300/4)

MANUAL OF THE MEDICAL DEPT.

Change 59, 27 Aug. 1970.

a. In articles 6–108(1) (c) & (4) (b) and 16–29 (2) & (4), adds requirement for the social security account number on the SF 603 and DD 722 and 722–1.

b. Updates chapter 6, Section XVI, Dental Officer Training.

c. Amplifies 6–150 for entry in part III of Dental Service Report if military strength served is classified.

d. To 14–78, Tissue Homografts Available, adds nerve and tendon tissues.

e. In 14–79 reflects a printing revision to the Deposit/Withdrawal Tissue Card.

f. Adds 14–80, Auxiliary Tissue Banks.

g. In 16–33 provides an alternate method of maintaining files of completed Sick Call Treatment Records.

h. Adds to 20–6(5) (b) (4), an OPNAVINST to be used by commanding officers for guidance when reviewing material for public disclosure.

i. Revises 20–8, Use of Volunteers in Medical or Other Hazardous Experiments.

BUMED NOTICE 6150, 1 Sept. 1970

Subj: Annual audit and disposition of Health and Dental Records.

Encl: (1) Chart for Disposition of Terminated and Closed Health Records.

In order to provide better service, BUMED has installed a terminal digit, Social Security Account Number (SSAN) filing system. Field activities must improve their record handling procedures. The enclosed chart should prove most useful as a guide to proper handling.

BUMED NOTICE 6150, 4 Sept. 1970

Promulgates instructions for referring cases to the Central Physical Evaluation Board (Central PEB) for determination of fitness for duty and possible entitlement to disability benefits under 10 U.S. Code, Chapter 61.

Effective 1 October 1970, a Central Physical Evaluation Board will be convened at the departmental level. The function and purpose of the Central PEB is to act as a fact-finding body to investigate the nature, cause, degree, and probable permanence of the disability of any party whose case is under consideration and to make recommended findings on the determinations required by law to establish eligibility for disability benefits administered by the naval service. Additionally, three formal Physical Evaluation Boards (located at the Naval Hospital, Bethesda, Maryland; the Ninth Naval District Headquarters, Great Lakes, Illinois; and the Naval Hospital, San Diego, California) will be convened on 1 October 1970, to provide a full and fair hearing for the party concerned whenever he has rejected the recommended findings of the Central PEB and has

requested consideration of his case at a full and fair hearing. Changes will be made to appropriate manuals and publications to reflect the above.

BUMED INSTRUCTION 1510.13, 10 Sept. 1970

Promulgates information for submitting applications to attend dental technician schools.

From CNO (2-34) to NAVOP

Uniform Changes

The dinner dress blue jacket and the dinner dress white jacket are now deleted as required items of

uniform for male lieutenants. These uniforms remain optional for wear by LIEUTENANTS AND BELOW.

From CNO (2-35) to NAVOP

BOQ/BEQ Conveniences

Subject to the provisions of paragraph 9 of SEC-NAVINST 1700.11, Base/Station Commanders may authorize installation of beer vending machines in BOQ's and Senior BEQ's for use of the occupants, subject to regulations issued by BASE/STATION Commanders. ☸

FROM THE MC DETAILER

Inquiries and formal requests are again being received from medical officers desiring a release from active duty one to four weeks prior to their normal release date. These requests are usually from doctors who wish to enter a civilian residency on the first of July, whose normal RAD date is 6 or 7 July. They should be aware that if their normal release date is 10 July or earlier, their release orders will direct detachment "in June in time for separation processing not later than" their July RAD date. This therefore authorizes permission for their commanding officers to separate such doctors as early as 1 June should they be able to do so. Consequently, a request to this Bureau for early release in the cases men-

tioned above only makes for needless paperwork. Medical officers in the category described above who desire consideration for release are advised to consult with their commanding officers who have authority for granting their early release should it be feasible.

All medical officers who contemplate a transfer next summer should ensure that a current Officers Preference Card is available to the detail desk prior to December 1970. Assignments for next summer are presently under consideration and in many cases either there is no preference card or the card available is over a year old. Residents completing their training are especially encouraged to submit a new card. —Code 317, BuMed. ☸

AWARDS AND HONORS

Silver Star Medal

Campbell, Richard A., HM3 USN
Hillhouse, David J., HM1 USN

Legion of Merit

Kent, Donald C., CAPT MC USN
Kitrinos, Nicholas P., CAPT MC USN

Navy and Marine Corps Medal

Kitrinos, Nicholas P., CAPT MC USN

Bronze Star Medal

Bennett, Floyd E., LCDR MSC USN
Doronzo, Paul F., HM3 USN
Drake, Wilbur R., CDR MSC, USN
Fleischer, Frederick C., HM3 USN
Furtoss, James A., LT MC USNR
Goss, James R., HM2 USN
Hatten, Arthur D., Jr., LT MSC USN

Bronze Star Medal (Con.)

Jordon, Ronald G., HM3 USN
Karam, Phillip L., HM3 USN
Kimble, Lawrence A., Jr., HM2 USN
Neczesny, William M., HN USN
Payamps, Richard R., HM2 USN
Robinson, Theodore A., HM1 USN
Schnabel, Paul E., HM3 USN
Serfustini, Anthony B., LT MC USNR
Sgroia, Anthony S., HN USN
Shackelford, Paul R., LT MSC USN
Shafter, Ralph E., HM2 USN
Wright, Russell L., HM3 USN

Joint Service Commendation Medal

Brandon, Daniel A., CDR MSC USN

Meritorious Service Medal

Andrews, Lois A., CDR NC USN
Pflag, Solomon C., CAPT MSC USN
Williams, Robert G. W., Jr., CAPT MC USN

Navy Commendation Medal

Aaron, Willard A., HMC USN
Beale, Calvin C., Jr., HM1 USN
Bergeron, Stephen E., HM3 USN
Bias, Ray A., HM2 USN
Broyles, Kermit E., CW04 USN
Cassidy, Michael K., HM3 USN
Chapdelaine, Jack A., CAPT MSC USN
Cooper, Norman R., HM3 USN
Dailey, George L., LCDR MSC USN
Daniel, Harold E., CDR MSC USN
Davis, Gary T., LTJG MSC USN
Davis, Thomas S., LT MC USNR
Davis, Walter D., HMC USN
Dunbar, Edward S., LCDR MSC USN
Dunn, David D., Jr., LTJG MSC USN
Grubb, Robert S., HMCM USN
Hampton, James C., HMC USN
Harrity, Andrew D., HMCS USN
Heath, Rodolph, Jr., HMC USN
Kliem, Lewis W., HM2 USN
Knapp, James K., HMC USN
Lambert, Paul R., HM1 USN
L'italien, Robert V., CDR MSC USN
Mohler, Dennis L., HM2 USN
Patterson, Patrick R., LT MSC USN
Peters, Thomas K., HM3 USN
Porter, Thomas E., HM3 USN
Reed, Eugene R., HM1 USN
Reed, John R., CDR MSC USN
Reinhardt, Roger F., CAPT MC USN
Reynolds, Charles M., HMCM USN
Ries, Marvin C., HMCS USN
Roach, Walter C., HM2 USN
Schaffner, Leslie J., CDR MSC USN
Segaya, Benigno P., HMC USN
Siegel, George G., HMCS USN
Simons, Lawrence E., Jr., HM2 USN
Smart, Richard D., HM2 USN
Stewart, Gene N., LT MSC USN

Navy Commendation Medal (Con.)

Sudduth, Herschel C., CAPT MC USN
Wilson, Katherine, CDR NC USN
Woods, Ronald S., LT MSC USN
Zimmerman, Lonnie V., LCDR MSC USN

Navy Achievement Medal

Ackert, Bernhard A., HMCS USN
Arnold, Robert J., HMCM USN
Bettencourt, David S., HM3 USN
Buchanan, William, HM1 USN
Burkholder, John H., HMC USN
Chavez, Juan M., HMC USN
Demaray, Bruce C., HM1 USN
Farrand, Donald R., HM2 USN
Gillis, Jack, HM1 USN
Hady, James A., Jr., HMC USN
Harden, James W., HM3 USN
Hartey, Thomas, J., HMC USN
Hartman, Richard B., HMC USN
Higgs, John R., HM2 USN
Hokanson, Thomas C., HM2 USN
Houston, Thomas E., HM1 USN
Ivory, Thomas M., III, LT MSC USNR
Johnson, Russel D., HM2 USN
Kehoe, John J., Jr., LCDR MSC USN
Keltner, Brantley R., HM3 USN
Lindamood, David, J., Jr., HM2 USN
Lynch, Jack T., HM3 USN
Margot, Benjamin W., HMC USN
Medley, Francis B., HM1 USN
Parrish, William C., LCDR MSC USN
Peckenpugh, Normand L., LCDR MSC USN
Petrides, Anthony H., HM1 USN
Platt, James G., Jr., HMCS USN
Reeves, Russell L., HMCS USN
Scott, Gordon R., HMC USN
Smith, Richard R., HM1 USN
Thetford, Robert D., HM2 USN
Vandiver, Roger D., HM3 USN

ISOLATION TECHNIQUES MANUAL

A new manual describing isolation principles and procedures has recently been published by Public Health Service. The manual is divided into six sections on different categories of isolation and precautions such as: respiratory isolation, protective isolation, enteric precautions, wound and skin precautions, discharge precautions, and blood precautions. There are seven appendices which provide lists of

infectious diseases grouped according to the degree, type and duration of isolation, recommendations for disinfection and sterilization, laundry procedures, etc. "Isolation Techniques For Use In Hospitals," PHS publication No. 2054 is available at \$1.00 per copy from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.—Code 722, BuMed.

DONATION OF TV SETS BY REPUBLICAN WOMEN'S CLUB OF CHEVY CHASE



Mrs. Alfred Taylor (center) and Mrs. Marcine Goodloe (right) of the Chevy Chase Republican Women's Club are thanked by CAPT Paul Kaufman, Director of Clinical Services at the Naval Hospital, National Naval Medical Center, Bethesda, Maryland for three television sets that the Women's Club donated to the Hospital. The sets will be used by patients on the wards.—PAO, NNMC, Bethesda. 🇺🇸

INDUSTRIAL ENVIRONMENTAL HEALTH—Increased national emphasis on community environment, as it affects health, has led to a concomitant increased emphasis on medical aspects of industrial environment within the Navy. BUMED last month reorganized and expanded its Occupational Health Division to better cope with the problems related to environmental health. The designation of the new organizational unit, under the direction of CDR G. M. Lawton, MC, will be the Industrial Environmental Health Division. This Division will be responsible for evaluating and determining the total industrial environmental health needs of the Navy. The Division is to be divided into three branches: 1) Occupational Medicine; 2) Industrial Environmental Control; and 3) Safety. 🇺🇸

COMMUNICABLE DISEASE MANUAL

"Control of Communicable Diseases in Man", NAVMED P-5038, is a paper-back booklet published by The American Public Health Association. An official report of the PHA, edited by A. S. Benenson, M.D., Univ. of Kentucky College of Medicine, the eleventh edition is now available and is an excellent guide for intelligent management of communicable disease, emphasizing principles (rather than standard administrative or technical procedures), because local conditions and interrelated problems commonly require variation in practices from state to state within the U.S., and between countries. ☘

BEARDS AND FOOD SERVICE WORKERS

Recent Navy policy relating to beards has resulted in numerous inquiries concerning the wearing of beards by food-service workers. The presence of food-service workers wearing beards introduces several untenable situations for Medical Department personnel.

The presence of hair in food has always been aesthetically revolting, thus the requirement for hair nets for women and a head-covering for men. There is no acceptable covering currently available to preclude facial hair from falling into food.

Another situation of serious consequence is the possibility of a beard becoming a reservoir of bacterial organisms. The ensuing practice of stroking, scratching, and fondling of beards by food-service workers could produce a substantial amount of food contamination.

It is realized that beards are currently fashionable and acceptable in many areas, but the presence of a food-service worker with a beard would not enhance the current sanitary standards. Consequently, personnel who are working in food preparation or serving areas should not be permitted to wear beards.—Environmental Sanitation Section, Preventive Medicine Division, BuMed. ☘

✠ In Memoriam ✠

CAPT Walter C. Espach, MC, USN, Retired, died of renal and pulmonary failure at the Naval Hospital, Bethesda, Md. on 12 September 1970. CAPT Espach was born 3 June 1888 in Cincinnati, Ohio. A graduate of Ohio State University Medical School, he was commissioned in the naval service 18 Aug. 1913, specialized in internal medicine and commanded the Naval Proving Ground Dispensary at Indian Head, Md. during World War I. Subsequent duty assignments took him to the Panama Canal Zone, Haiti and the Philippines. During World War II he served as hospital administrator of a mobile hospital unit in New Caledonia. Following retirement on 1 Jun. 1946, he became Chief of Staff at the Physicians Memorial Hospital in Charles County, Md. He lived in Bryans Road, Md. prior to his death, and is survived by his wife, a daughter, two grandchildren and two great-grandchildren.

RADM Dallas Gilchrist Sutton, MC, USN, Retired, died 16 September 1970 at the Naval Hospital, Bethesda, after a long illness. RADM Sutton was born 1 September 1883 in the District of Columbia. He was graduated from George Washington University Medical School in 1907 and entered the Navy the same year. Admiral Sutton specialized in psychiatry and conducted pioneer psychologic studies of Naval Aviator Candidates in Pensacola, in the late 1920's. From 1936 to 1940, he was the Deputy Chief of BUMED; he subsequently was in charge of planning and construction of NNMC, Bethesda. During most of World War II, and until he retired in 1947, RADM Sutton served as Inspector Medical Department Activities. Following retirement, he served for many years as consultant on Federal hospitals to the American Hospital Association. RADM Sutton is survived by his widow, Violet, and two daughters, Mrs. Virginia S. Ringness and Mrs. Elizabeth S. Lasater. ☘

ANNUAL AHA CONVENTION—The Annual Convention of the American Hospital Association was held in Houston, 14-17 September. CAPT E. L. Van Landingham, Jr., MSC, headed a Bureau group which attended. At the 36th Convocation, 11 Navy MSC officers and 1 MC officer were made nominees of the American College of Hospital Administrators. Two MSC officers were promoted to full membership. ☘

United States Navy Medicine

CORRESPONDENCE AND CONTRIBUTIONS from the field are welcomed and will be published as space permits, subject to editing and possible abridgment. All material should be submitted to the Editor, U.S. Navy Medicine, Code 38, Bureau of Medicine and Surgery, Washington, D.C. 20390.

NOTICES should be received not later than the third day of the month preceding the month of publication.

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SUGGESTIONS are invited concerning U.S. Navy Medicine, its content and form.

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